NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

THE EFFECT OF MOS SELECTION AND PLACEMENT ON THE RETENTION OF MARINE COMPANY GRADE OFFICERS

by

Justin L. Blackmon

March 2009

Thesis Co-Advisors: Stephen Mehay
Elda Pema

Approved for public release; distribution is unlimited

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE		*Form Approved OMB No. 0704-0188*

1. AGENCY USE ONLY *(Leave blank)*	**2. REPORT DATE** March 2009	**3. REPORT TYPE AND DATES COVERED** Master's Thesis

4. TITLE AND SUBTITLE The Effect of MOS Selection and Placement on the Retention of Marine Company Grade Officers

5. FUNDING NUMBERS

6. AUTHOR(S) Justin L. Blackmon

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Naval Postgraduate School
Monterey, CA 93943-5000

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES)
N/A

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.

12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited	**12b. DISTRIBUTION CODE**

13. ABSTRACT (maximum 200 words)

The purpose of this thesis is to assess the relationships between MOS placement and retention of company grade officers. An officer data file from the Center of Naval Analyses is augmented with Total Force Data Warehouse data to create the primary analysis data file. The data set contained officer cohorts from 1994-1999 and 2001 to 2002, a total of 5,922 newly commissioned officers. Several five- and six-year multivariate retention models are estimated to test the sensitivity of the retention effect of MOS preferences and to determine if including prior enlisted Marines in the data affects the basic effects. The objective is to isolate the effects on junior officer retention of MOS placement outside of an officer's top three MOS preferences.

The findings indicate that MOS placement has a strong negative effect on the retention of NROTC, PLC, and OCC graduates. Among demographic groups, black and Asian officers are more likely to retain than white officers. Significant differences in retention do not exist between men and women; however, when prior enlisted officers are included in the samples, the sizes of the key coefficients fall in magnitude. The findings for the six-year model indicate no significant effects of MOS placement, gender, or race, with and without prior enlistees, on the retention decision of officers who graduate from USNA.

14. SUBJECT TERMS Marine Corps, USMC, The Basic School, TBS, MOS Preferences, MOS Assignment, Officer Career Paths, Alternative Career Paths, Naval Postgraduate School, NPS, Special Education Program, SEP, FAO, RAO	**15. NUMBER OF PAGES** 121
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT Unclassified	**18. SECURITY CLASSIFICATION OF THIS PAGE** Unclassified	**19. SECURITY CLASSIFICATION OF ABSTRACT** Unclassified	**20. LIMITATION OF ABSTRACT** UU

THIS PAGE INTENTIONALLY LEFT BLANK

THE EFFECT OF MOS SELECTION AND PLACEMENT ON THE RETENTION OF MARINE COMPANY GRADE OFFICERS

Justin L. Blackmon
Captain, United States Marine Corps
B.S., United States Naval Academy, 2003

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

**NAVAL POSTGRADUATE SCHOOL
March 2009**

Author: Justin L. Blackmon

Approved by: Stephen Mehay
                 Co-Advisor

                 Elda Pema
                 Co-Advisor

                 William Gates
                 Dean, Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

The purpose of this thesis is to assess the relationships between MOS placement and retention of company grade officers. An officer data file from the Center of Naval Analyses is augmented with Total Force Data Warehouse data to create the primary analysis data file. The data set contained officer cohorts from 1994-1999 and 2001 to 2002, a total of 5,922 newly commissioned officers. Several five- and six-year multivariate retention models are estimated to test the sensitivity of the retention effect of MOS preferences and to determine if including prior enlisted Marines in the data affects the basic effects. The objective is to isolate the effects on junior officer retention of MOS placement outside of an officer's top three MOS preferences.

The findings indicate that MOS placement has a strong negative effect on the retention of NROTC, PLC, and OCC graduates. Among demographic groups, black and Asian officers are more likely to retain than white officers. Significant differences in retention do not exist between men and women; however, when prior enlisted officers are included in the samples, the sizes of the key coefficients fall in magnitude. The findings for the six-year model indicate no significant effects of MOS placement, gender, or race, with and without prior enlistees, on the retention decision of officers who graduate from USNA.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENTS

I would like to extend my sincerest gratitude to Dr. Stephen Mehay and Dr. Elda Pema whose support, instruction, and mentorship were invaluable to my education and thesis completion.

I would also like to thank Major Darby Wiler, USMC for his assistance and help with the Center of Naval Analyses in obtaining the necessary data for this thesis.

I would like to thank Steve Nguyen at SAIC for his technical support in gathering data from the Total Force Data Warehouse.

Finally, I would like to thank my wife Anna for her love, patience, support, and gentle prodding to finish on time.

THIS PAGE INTENTIONALLY LEFT BLANK

I.   INTRODUCTION

A.   BACKGROUND

Job placement is a crucial milestone in an officer's career that impacts and shapes the officer's initial tour and follow-on career decisions. To understand the importance of job placement fully, it is necessary to first explore the factors that shape the process.

Organizational culture and image are an important part of the Marine Corps' identity. The Marine Corps is the smallest of the four service branches within the Department of Defense, but yet has one of the most distinct, robust, and unique service cultures. The men and women who fill its ranks both share and reinforce that identity. The Marines are a highly selective organization with a strong cultural allure. The men and women who choose to serve in the Marines do so voluntarily and are carefully screened to ensure that the applicant will fit the organization. Once candidates enter service, the Marine Corps invests a great deal in their human capital to shape and ingrain behavioral attitudes congruent with the organization's culture. This investment typically occurs during entry-level indoctrination at Naval Reserve Officer Training Programs, the United States Naval Academy, Officer Candidate School, or The Basic School.

From the very initial decision to serve, applicants must make informed decisions about the occupation, environment, and the culture of the prospective services they may enter. Ideally, an applicant would have sufficient information about each service to determine if that occupation would fit his or her individual aptitude and interests. The Marine Corps assists applicants in making informed decisions by providing officers with ample information, experiences, and real-world application in each of its commissioning sources. Applicants are also provided a host of options and alternatives to prepare them for the decision to join the Marines. This preparation helps to ensure that officers are ready to lead Marines.

Since the Marine Corps utilizes a closed-loop personnel system to recruit, develop, and train its future leadership, officers enter the force in large cohorts of entry-

1

level applicants who are initially trained to fill company grade positions. As they progress in their careers, officers are trained and developed to fill higher-ranking positions.[1] This accession and training policy ensures that senior leaders are educated, have a wealth of experience, and are well indoctrinated into the Marine Corps organization.

Entry into the officer corps comes from seven main accession programs. These programs include the United States Naval Academy (USNA), Naval Reserve Officer Training Course (NROTC), Officer Candidate Course (OCC), Platoon Leader Course (PLC), Marine Enlisted Commissioning Education Program (MECEP), Enlisted Commissioning Program (ECP), and Meritorious Commissioning Program (MCP). Exiting the Marine Corps is done either voluntarily, by honorable discharge, by resignation of commission, or by retirement, or involuntarily, through court marital, medical disqualification, death, or due to the needs of the Marine Corps.

Job placement for the majority of newly commissioned Marine officers occurs at The Basic School (TBS). Except for a few select guaranteed contracts into Military Occupational Specialties (MOS) such as Judge Advocate (4402), Naval Flight Officer (7580), and Pilot (7599), officers must compete for available MOS quotas during their training at TBS. Although Limited Duty Officers (LDO) and Warrant Officers (WO) fall into the officer category, LDO's and WO's will be excluded from this thesis since they are considered restricted line. Restricted line officers are officers who serve in a specialized field and who cannot serve in a command billet.

The Basic School is a six-month long indoctrination program designed to provide all Marine officers with the necessary professional knowledge and skills required to lead Marines as company grade officers. Officers complete rigorous courses of instruction both in the field and in the classroom, including leadership, marksmanship, land navigation, communications, infantry tactics, weapons, military law, drill, personnel

---

[1] Martha E. Koopman, *Creating Innovative Career Paths* (Alexandria, VA: Center of Naval Analyses January 2006), 6-7.

administration, and Marine Corps customs and courtesies.[2] All Marine officers are required to complete TBS before they can continue their careers in the Marine Corps.

Not only are the courses at TBS designed to produce quality company grade officers, but are also a way to give officers information and experience on a wide breadth of MOSs. Officers are indoctrinated with the knowledge, skills, and abilities required for a variety of occupational fields, as well as the work environment and ethics required to be successful in those jobs.[3] Officers are encouraged to ask questions, interact, and seek information from TBS resources and staff on their future potential jobs. This process helps to ensure that officers have sufficient knowledge and experience to make informed MOS decisions during the job selection process.

While at TBS, officers are evaluated and ranked on their performance. Although officers are given the opportunity to list their MOS preferences, they are placed in MOS quotas based on the needs of the Marine Corps and their performance ranking. Every effort is made to place an officer in one of his or her top preferences.[4] However, since every MOS is limited in the number of quotas available, not every officer will receive an MOS within his or her top three choices.

After TBS, officers must attend follow-on MOS training before he or she can transition to an MOS-specific job or billet. All officers leaving TBS will fill a Fleet Marine Forces (FMF) billet, typically for three years, upon graduating his or her MOS school.[5] Once an officer has completed an initial FMF tour, that officer may choose to complete another FMF tour or choose a non-FMF billet. A non-FMF billet may or may not have a specific MOS requirement. However, a non-FMF billet will typically have a specific rank requirement.

---

[2] Marine Corps Recruiting Command, http://www.MarineOfficer.com/page/The-Basic-School-O (accessed December 1, 2008).

[3] Ibid.

[4] The Basic School, http://www.tbs.usmc.mil/All_MOS_Assignment_Process (accessed December 2, 2008).

[5] Ibid.

Graphical displays of typical career paths by a warfare community are provided in the Appendix.[6] A warfare community is a grouping of MOSs with similar functions. The Combat Arms community is populated by MOSs that directly engage in ground combat, such as infantry, artillery, and tanks. The Combat Service Support (CSS) community is populated by MOSs that provide supporting functions to the Combat Arms MOSs, such as legal, logistics, supply, and administration. The Aviation community is composed of three sub-categories; Air-Ground Support, Rotary Wing, and Fixed Wing. The Air-Ground sub-community is composed of MOSs that support aviation, such as aviation maintenance and aviation supply. The Rotary Wing community is composed of helicopter aviators. Likewise, the Fixed Wing community is composed of fixed wing aircraft aviators.

Within each community is a monitor that tracks the available billets for each MOS within the Marine Corps. Each monitor is tasked with managing and scheduling officer billet rotations based on the Marine Corps' manning structure. As an officer comes to the end of one billet assignment, he or she will work closely with his or her community monitor to find a suitable future billet. Assignments are based on the needs of the Marine Corps; however, officers are allowed to choose from a list of available billets. This process allows officers to have some input into their next assignment and progression of their career path.

There are, however, certain career tracks within the Marine Corps that deviate from the norm. These tracks require special application by officers and have specific qualifications that must be met to allow officers access. The Special Education Program (SEP), Advanced Degree Program (ADP), and International Affairs Officer Program provide officers with a secondary or Additional MOS (AMOS) that allows them to fill billets outside of their primary occupational field. This deviation allows them to pursue a career path distinctly different from their peers. The key differences between the two tracks are that secondary MOS programs must be self-selected and have qualification requirements that exclude some officers from participation.

---

[6] The Basic School, http://www.tbs.usmc.mil/All_MOS_Assignment_Process.

An officer who does not receive his or her top MOS preference at TBS may be less satisfied with his or her job and prospective career path compared to an officer who did receive one of his or her top preferences. In some cases, these officers may choose to leave the Marine Corps to pursue a better job fit in the civilian job market. Others may choose to stay in the Marine Corps due to the retirement benefits, culture, or available billet assignments. The remainder of this thesis will identify the effects of the job placement process on the retention of junior officers and demographic groups within the junior officer cohorts.

Regardless of the factors that may affect an officer's personal retention decision, culture plays a significant role in the decision process. The cultural pull of the Marine Corps is distinct and quite strong in its officer corps. The author hypothesizes that some officers may have a taste for the Marine Corps way of life that outweighs the dissatisfaction they may receive from a poor job fit. These officers may be drawn to serve and will seek other ways to stay in the Marine Corps outside of their normal career path. By doing so, these officers can alleviate the dissatisfaction from poor job fit and remain longer in the Marine Corps by choosing an alternative career path. The remainder of this thesis will identify this group of Marines and determine if taste for the Marine Corps culture plays an important role in the decision to select an alternative career path.

B. PURPOSE

The purpose of this thesis is to evaluate quantitatively how the placement of Marine officers at TBS affects retention, in particular, how failure to receive an MOS in their top three preferences affects Marine officers' retention behavior. This research will focus on the retention aspects of the MOS selection process to determine if officers who receive an MOS outside of their top preferences are more likely to separate than officers who do receive an MOS within their top three preferences. Lastly, this research will examine the differences in retention for different demographic groups.

C.   RESEARCH QUESTIONS

1.   Primary Research Question

How does the assignment of an MOS outside of an officer's top three MOS choices affect the retention of newly commissioned officers?

2.   Secondary Research Questions

Are there any demographic groups, such as women or minorities affected more by MOS placement than others?

D.   SCOPE AND LIMITATIONS

This thesis is designed to examine the relationships between MOS placement and selection on the retention of officers between the ranks of second lieutenant and major. The author will analyze officer data obtained from the Total Force Data Warehouse (TFDW) and TBS officer cohort data from the Center of Naval Analyses (CNA). The range of the data studied covers a time period from 1994 to 1999 and from 2001 to 2002. Officers who fall into the Limited Duty Officer, Warrant Officer, Pilot, Naval Flight Officer, and Judge Advocate MOSs will be excluded from the study due to their qualification and contractual restrictions.

E.   ORGANIZATION OF THE STUDY

This thesis is organized into six chapters. Following this introduction, Chapter II will provide further details about TBS, the commissioning process, and the job selection/placement process. Chapter III will provide a summary of the methodology, techniques, and key findings used in previous literature to expand and justify the approaches of this thesis. Chapter IV will provide a preliminary analysis of the data used and summary statistical analysis. Chapter V will establish the research methodology for the regression models, while Chapter VI will provide the results for each of the regression models. Chapter VII will conclude the thesis by summarizing the results, conclusions, and recommendations.

II. AN OVERVIEW OF MARINE COMMISSIONING SOURCES, THE BASIC SCHOOL, THE JOB PLACEMENT PROCESS, CAREER PATHS, AND INTERNAL LABOR MARKETS

A. PURPOSE

The main purpose of Chapter II is to provide a more robust overview of factors outlined in Chapter I that may affect a Marine's retention and career path choices. First, the chapter will provide background for each commissioning source to show the different levels of human capital investment involved with each. Moving to The Basic School, the chapter provides a thorough explanation of the job placement process and how that process affects a Marine's career path upon graduating TBS.

B. COMMISSIONING SOURCES

Seven main commissioning sources provide the Marine Corps with its junior officer cohorts. Each program is briefly described below.

1. United States Naval Academy (USNA)

Located in Annapolis, Maryland, the United States Naval Academy is a four-year resident undergraduate institution that culminates in the rewarding of a Bachelor's of Science degree and commissioning as officers into the Navy or Marine Corps.[7] Applicants must be U.S. citizens, unmarried, not be pregnant, have no dependents, be medically qualified, pass a physical fitness test, and be at least 17 years of age, but no more than 23 years of age by July 1 of the year they enter the Academy.[8] The USNA provides a rigorous curriculum that concentrates on the moral, mental, and physical education of its midshipmen by immersing them in a stringent four-year resident

---

[7] 10-12, "Introduction," *USNA Catalog 2007-2008*, The United States Naval Academy, http://www.usna.edu/Catalog/ (accessed December 5, 2008).

[8] The United States Naval Academy Admissions, http://www.usna.edu/Admissions/steps2.htm (accessed December 5, 2008).

program. The Academy is a highly competitive program with a large pool of applicants each year. In 2008, approximately 1,200 of the 14,000 or more applicants were admitted as midshipmen.[9]

Each year, up to one-sixth (roughly 166 individuals) of the approximate 1,000 midshipmen graduating may be selected for commissioning into the Marine Corps.[10] Upon graduation, officers incur a five-year active duty service obligation.[11] Naval Academy graduates incur the longest service obligation of all the Marine commissioning services due to the length and cost of the funded education they receive.

2.   Naval Reserve Officer Training Course (NROTC), Marine Option

The NROTC program is designed to educate and train highly qualified men and women for careers as commissioned officers in the Naval service. The NROTC scholarship program pays full tuition, academic fees, subsistence allowances for freshmen, book stipends, and uniforms.[12] Applicants must be at least 17 years of age by September 1 of the year he or she starts college, but less than 23 years of age June 30 of the same year. Applicants must not exceed 27 years of age by June 30 of his or her graduation year. Furthermore, applicants must be a U.S. citizen, obtain a minimum combined SAT score of 1000 or ACT 45, meet Marine Corps physical requirements, and have no criminal record.[13] Midshipmen who graduate and receive a commission from the NROTC program are required to serve eight years from the date of commissioning, with at least four years on active duty and the remaining four years in the reserves. A full list of requirements can be found in the Fiscal Year 2009 Naval Reserve Officer Training Corps, Marine Option Scholarship Program MARADMIN.

---

[9] "United States Naval Academy Class of 2012 Class Profile," The United States Naval Academy Admissions website, http://www.usna.edu/Admissions/ (accessed December 5, 2008).

[10] "Career Opportunities after Graduation," *USNA Catalog 2007-2008*, The United States Naval Academy, 5, http://www.usna.edu/Catalog/ (accessed December 5, 2008), 149-151.

[11] "Admissions," *USNA Catalog 2007-2008*, The United States Naval Academy, http://www.usna.edu/Catalog/ (accessed December 5, 2008), 26.

[12] FY2009 NROTC MARADMIN 508/08, http://www.marines.mil/news/messages/Pages/MARADMIN508-08 (accessed December 6, 2008).

[13] Marines.USMC.mil, Naval Reserve Officer Training Course Requirements, https://www.marines.usmc.mil/G3/Officer/nrotcrequirement.htm (accessed December 4, 2008).

3.   Platoon Leaders Course (PLC)

The Platoon Leaders Course is designed for officer candidates who are still enrolled in a full-time college. This course provides individuals with the opportunity to attend Officer Candidate School (OCS), located in Quantico, VA, without interrupting their academic year. Officers enrolled in PLC attend two six-week courses at OCS after their freshman and sophomore academic years. Officers enrolled in PLC who are juniors complete a ten-week OCS session after their junior year.[14]

4.   Officer Candidate Course (OCC)

The OCC is designed to provide college seniors or graduates an opportunity to experience the Marine Corps culture and way of life with no commitment to serve. Candidates are indoctrinated into the Marine Corps through a 10-week course at OCS. At that point, a candidate can voluntarily choose to serve and receive a commission. Candidates who accept a commission incur three and one half years of obligated service from their date of commissioning. Immediately upon graduation, officers are sent to TBS in Quantico, VA.[15] Officer Candidate Course is also used to guarantee some contracts into the Judge Advocate Corps and aviation communities before officers enter the Marine Corps and job placement process at TBS.

5.   Marine Enlisted Commissioning Education Program (MECEP)

The MECEP is designed to provide regular active duty enlisted Marines the opportunity to earn a college degree and receive a commission into the Marine officer corps. Applicants must have a minimum of six years of active service and have attained the rank corporal or above. Applicants must also score a minimum of 1000 on the SAT, with a minimum 400 on verbal, and must be at least 21 years old, but no more than 26 by the July 1 of the application year. A complete list of application requirements can be

---

[14] Marine Corps Recruiting Command, http://www.MarineOfficer.com/page/Platoon-Leaders-Class-O (accessed December 3, 2008).

[15] Marine Corps Recruiting Command, http://www.MarineOfficer.com/page/Officer-Candidate-Class-O (accessed December 3, 2008).

found in Marine Corps Order (MCO) 1560.15L.[16] Officers commissioned via MECEP incur a 4-year minimum service obligation upon graduation and commissioning.[17] Upon commissioning, officers will attend OCS for Marine officer training.

6.   Enlisted-to-Officer Commissioning Programs

This commissioning program consists of two categories detailed below.

a.   Enlisted Commissioning Program (ECP)

The Enlisted Commissioning Program is designed to allow qualified regular Marine Corps and Marine Corps Active Reserve (AR) to apply for assignment to OCS and subsequent appointment to the unrestricted officer corps.[18] Applicants must obtain a bachelor's level degree from an accredited regional college or university prior to application. Applicants must also be a U.S. citizen, achieve a minimum combined score of 1000 on the SAT or a combined score of 45 on the ACT, and must be at least 21 years of age, but less than 30 years of age at the date of commissioning.[19] Upon graduation from OCS and commissioning, officers must serve a minimum of eight years, with at least four years on active duty and four years in the reserves.[20] A full list of requirements can be found in MCO1040.43A Enlisted-to-Officer Commissioning Programs.

b.   Meritorious Commissioning Program (MCP)

The MCP allows commanding officers the ability to nominate highly qualified enlisted Marines in the regular and active reserves who do not yet have a bachelor's level degree, but have demonstrated exceptional leadership potential for appointment to OCS and subsequent commissioning in the Marine Corps Reserves. Applicants must have successfully earned an Associate's degree or completed 75

---

[16] Marine Corps Order 1560.15L Marine Corps Enlisted Commissioning Education Program, August 16, 1994, 1.

[17] Ibid., 2.

[18] Marine Corps Order 1040.43A Enlisted-to-Officer Commissioning Programs, May 2, 2000, 1.

[19] Ibid., 3-4.

[20] Ibid. 10.

semester hours or more of unduplicated college work at a regionally accredited college or university.[21]   Upon graduation from OCS and commissioning, officers must serve a minimum of eight years, with at least four years on active duty and four years in the reserves.[22] A full list of requirements can be found in MCO1040.43A Enlisted-to-Officer Commissioning Programs.

C.   THE BASIC SCHOOL

The Basic School (TBS) is an entry-level officer training school located in Quantico, Virginia designed to train officers from every Marine commissioning source as a provisional rifle platoon commander. The twenty-six week training period includes junior officer evaluation in three major areas: Military Skills, Academics, and Leadership abilities.[23] The training regiment encompasses physical fitness tests, weapons training, live fires, marksmanship, infantry tactics, graded examinations, leadership role-playing, counseling, mentorship, and instructor evaluations. As the training progresses, officers are scored and evaluated on their performance in each area by the instructors and company staff. The Military Skills, Academic, and Leadership scores are combined to create an overall cumulative score, which is used to create a class ranking of the best to worst performances. The class ranking is then later used to decide which officers will have the first chance for job placement.

Specific jobs in the Marine Corps are designated as a Military Occupational Specialty (MOS) and coded with a four digit numeric code. The first two digits serve to identify the specific occupational field. The second two digits designate a specific task or billet within that occupational field. Currently, there are approximately 26 MOS's, which officers can potentially enter. Figure 1 shows a current list of officer MOSs.

---

[21] Marine Corps Order 1040.43A Enlisted-to-Officer Commissioning Programs, 4.

[22] Ibid., 10.

[23] The Basic School, http://www.tbs.usmc.mil/All_MOS_Assignment_Process.

Figure 1.   Current Officer Military Occupational Specialties

MOS DESCRIPTION	CATEGORY
0180 – Adjutant	Combat Service Support
0202 - Intelligence Officer	Combat Service Support
0203 - Ground Intelligence Officer	Combat Service Support
0204 - Human Source Intelligence Officer	Combat Service Support
0206 - Signal Intel Ground Electronic Warfare Officer	Combat Service Support
0207 – Air Intelligence Officer	Combat Service Support
0302 – Infantry Officer	Combat Arms
0402 – Logistics Officer	Combat Service Support
0602 – Command and Control Systems Officer	Combat Service Support
0802 – Field Artillery Officer	Combat Arms
1302 – Combat Engineer Officer	Combat Arms
1802 – Tank Officer	Combat Arms
1803 – Amphibious Assault Vehicle Officer	Combat Arms
3002 – Ground Supply Officer	Combat Service Support
3404 – Comptroller	Combat Service Support
4302 – Public Affairs Officer	Combat Service Support
4402 – Judge Advocate	Combat Service Support
5803 – Military Police Officer	Combat Service Support
6002 – Aircraft Maintenance Officer	Aviation
6602 – Aviation Supply Officer	Aviation
7204 – Low Altitude Air Defense Officer	Aviation
7208 – Air Support Officer	Aviation
7210 – Air Defense Control Officer	Aviation
7220 – Air Traffic Control Officer	Aviation
7580 – Naval Flight Officer	Aviation
7599 – Pilot	Aviation[24]

---

[24] The Basic School, http://www.tbs.usmc.mil/All_MOS_FAQ (accessed December 9, 2008).

D. THE JOB PLACEMENT PROCESS

Starting in 1977, the Commandant of the Marine Corps mandated that a quality spread would be applied to the assignment of TBS graduates to MOSs. A quality spread would ensure that each occupational field received a fair share of high quality lieutenants. This policy is still in effect today under the guidance of the Marine Manpower Officer Assignment Division (MMOA), stating that one-third of all job quotas for each MOS will come from the top, middle, and bottom thirds of each TBS company. Within each third, class standing will be the primary means for MOS assignment.[25]

Aside from technical training, officers are provided information on different occupational fields through MOS mixers, enlisted Marine interaction, training exercises, basic studies, and online MOS references. Officers are encouraged to seek out jobs that highlight their specific strengths and interests. Using the information they have obtained, officers will formally submit their MOS choices in order of preference, the first as the most desirable and the last as their least desirable, to their TBS Company chain-of-command for job placement at approximately the fourteenth week of training.[26]

During this phase, officers with a guaranteed contract are factored out of the class standings. Guaranteed contracts are for three main categories; Judge Advocates (4402), Naval Flight Officers (7580), and Pilots (7599). The remaining officer cohort is divided into thirds based on class standing; the top, middle, and bottom. For example, if the cohort without guaranteed contracts was composed of 99 officers, the cohort would be ranked from 1 to 99, with 1 being the top performing officer. The cohort would then be broken into equal thirds, one to thirty-three, thirty-four to sixty-six, and sixty-seven to ninety-nine. The available jobs are then divided equally among the thirds. Job availabilities are provided to the TBS company staff by MMOA-3 (Plans, Programs, and System Support) based on the current manpower structure requirements for each MOS.[27]

---

[25] The Basic School, http://www.tbs.usmc.mil/All_MOS_Assignment_Process.

[26] Ibid.

[27] Ibid.

Once the class has been divided into thirds, officers are then placed into available MOSs starting with the top Marine in each third. Thus, a Marine has a better chance of receiving one of his or her top MOS choices if he or she is at the top of his or her third. Conversely, a Marine has a smaller chance of receiving his or her top choice if he or she is near the bottom of his or her third. Once all the MOS quotas have been filled, the company staff can consider deviating from the student officer's preferences to meet the needs of the Marine Corps. For example, the company staff may deem that a Marine at the bottom of a third who received an MOS outside of his or her top three preferences may be a better fit for an MOS filled by someone higher in that particular third. In this circumstance, the staff may swap MOS's in a limited manner to ensure a better job fit to meet the needs of the Marine Corps. This deviation is subject to the discretion of the staff and approval of the Company Commander.[28]

The final list of job placements is then submitted to the Commanding Officer (CO) of TBS. Any officer who did not receive an MOS within his or her top three preferences is briefed to the CO. The CO must approve the list before it is submitted to Manpower and Reserve Affairs (M&RA) for final approval. Once M&RA approves the list, it is then released to the officer cohort. On average, approximately 75% of lieutenants receive an MOS within their top three preferences.[29]

E.   CAREER PATHS

As discussed in Chapter I, officers are required to complete an MOS-specific school before filling a fleet billet after TBS. The length of training varies depending on the Marine's specialty. Once MOS training is complete, officers are sent to the fleet to fill an MOS-specific billet. The Fleet Marine Force (FMF) billet serves to establish a base for the individual's technical experience, provide company grade billet development, and provide the Marine Corps a return on investment from the general and organizational-specific training Marine officers are provided.

---

[28] The Basic School, http://www.tbs.usmc.mil/All_MOS_Assignment_Process.

[29] Ibid.

Normal career paths are specific to each occupational field; however, some generic characteristics are similar across all MOSs. Two common characteristics among all MOS's are FMF and non-FMF billets. An FMF or fleet billet is defined as a job specific to a MOS or occupational field. A non-FMF billet is a billet that may or may not have a specific MOS qualification requirement. Non-FMF billets do, however, have rank requirements. For example, a Marine who enters the Combat Service Support (CSS) occupational field is expected to fill a FMF billet directly upon graduation from his or her PMOS school. Once the initial tour is complete, a CSS officer is expected to move to a non-FMF billet to expand the officer's experience, before accepting an additional FMF tour. Depending on each officer's preferences, this expected order may or may not be the case. In many situations, a CSS officer may choose to select a FMF-billet directly upon completing the first FMF tour before continuing to a non-FMF billet. The Appendix provides charts depicting the typical career paths for each occupational field.[30]

F.   RANK PROGRESSION

After completing TBS, most officers enter the Marine Corps at the rank of second lieutenant (O-1). There are a few exceptions, such as some JAG officers who may enter TBS as a first lieutenant, but these officers are excluded from this thesis. From the date of commissioning, promotion to the rank of first lieutenant (O-2) and captain (O-3) is fairly predictable and expected. Promotion to O-2 typically occurs two years after the date of commissioning. Promotion to O-3 typically occurs two to three years after the date of rank for O-2. Thus, a typical officer will acquire the rank of O-2 or O-3 at the end of his or her mandatory service obligation.

This rank progression is not the case for promotion to major (O-4). Promotion to this rank can range from eight to ten years of commissioned service. The rank of O-4 is also significant because each individual in zone for promotion is scrutinized by a promotion board, making the process much more competitive. Due to the length of

---

[30] The Basic School, http://www.tbs.usmc.mil/All_Career_Progression (accessed December 9, 2008).

service and promotion board requirements, promotion is not guaranteed. Many officers may also leave the service before this decision point, retire after twenty years of total service, or simply may not be selected by the promotion boards.

G. SUMMARY

In summary, the commissioning sources outlined in Chapter II provide the Marine Corps with a wide range of differing levels of human capital investment. However, regardless of the commissioning source, every officer enters The Basic School to be trained as a provisional rifle platoon commander. During training at The Basic School, officers are provided a sufficient level of MOS education to provide Marines with the information needed to make informed MOS preference decisions. During the selection process, the Marine Corps attempts to place Marines within one of their top MOS choices. The outcomes of the selection process affect not only a Marine's initial tour, but subsequent tours, and career expectations as well.

III. LITERATURE REVIEW

A. INTRODUCTION

Since the issue of fit and job placement have long-term implications for an individual's job satisfaction, several factors must be considered when constructing models to determine the propensity for someone to stay in the Marine Corps based on job preferences and the propensity for an individual to seek alternative career paths. To conduct an analysis on the research questions successfully, the author plans to examine a variety of methods and approaches that may provide relevant solutions to specific portions of this research.

B. METHODOLOGY

This section of the literature review provides a background on the general ordering of the retention model from the date of commissioning to the retention decision point. Numerous studies have been done on the aspects of retention. For the purpose of this thesis, the author is going to focus on Ronald Fricker's 2002 RAND article, "The Effects of Perstempo on Officer Retention in the U.S. Military."

Ronald Fricker analyzes the effects of deployment tempo on the retention of two groups: junior officers (O-2s to O-3s) after the initial tour obligation between the fourth and fifth year of commissioned service, and midgrade officers (O-3s to O-4s). Since most junior officers incur a mandatory service obligation upon commissioning, Fricker structured the junior officer model differently than the midgrade officer model. He argues that junior officers do not, initially, have the information needed to make an informed career decision. Officers who chose to stay beyond the initial service obligation are distinctly different from those who chose to leave. Officers who stay must be more informed to make a clear career decision to stay. Officers who choose to stay also do not incur further service obligation, giving them the ability to resign at different points.[31]

---

[31] Ronald Fricker, *The Effects of Perstempo on Officer Retention in the U.S. Military* (Santa Monica, CA: RAND, 2002), 20.

Using these junior officer characteristics, Fricker was then able to specify a logistic regression to predict the log odds of retention for the junior officer group up through the six-year decision point. He used the six-year point based on the five-year minimum service obligation of service academy graduates with an added year to account for individuals who may not have had the opportunity to leave exactly at the expiration of their obligated service.[32] While other commissioning sources may have shorter periods of obligated service, the same retention assumptions hold true. Officers who choose to leave the military, will have done so by their six-year point.

Since midgrade officers have key distinctions from junior officers, and midgrade officers have the ability to separate from the service at any time after their initial service obligation, Fricker used survival analysis to estimate officer hazard ratios for retention.[33] Fricker then separated his analysis into two major divisions. The first division was designed to account for differences between service branches by specifying separate statistical models for each service.[34] The second division was designed to account for temporal changes over the total time frame of the study by specifying each model for an early and late 90s range.[35]

After accounting for other observable characteristics, such as occupation and demographics in the logistic regression model, Fricker concluded that deployment tempo had several key effects on the retention of officers. The first was that increased non-hostile deployment tempo had a positive association with retention for both junior and midgrade officers. He also learned that hostile deployments had negative effects on the retention of junior officers, but either mitigated or had potentially positive retention effects for midgrade officers.[36] The author attributed this small effect to potential self-

---

[32] Fricker, *The Effects of Perstempo on Officer Retention in the U.S. Military*, 5, 22.

[33] Ibid., 29.

[34] Ibid.

[35] Ibid., 30.

[36] Ibid., 35.

selection effects, since officers who advance beyond their initial tour obligation make a conscious career decision to stay.[37] The last finding was that lack of deployment time had a negative effect on the retention for junior officers.

C.   VARIABLES

1.   Deployment Tempo

Three categories of deployment information based on the data available are used in specifying the regression models used in this thesis. The three areas necessary for the regression models are the following: Global War on Terrorism (GWOT) deployed days, Non-GWOT deployed days, and crisis area locations.

Fricker created a deployment tempo variable using Imminent Danger Pay and Family Separation Allowance pay data. The deployment variable was further divided into two types of deployments, hostile and non-hostile.[38] Both variables were found to be significant factors in determining the log odds of retention for junior officers.[39]

In 2006, Aline Quester, Anita Hattiangadi, and Robert Shuford used deployment tempo as an independent variable to determine the effects of post-9/11 deployments on the retention of Marines with and without dependents in their research article, "Marine Corps Retention in the Post-9/11 Era: The Effects of Deployment Tempo on Marines with and without Dependents." Deployment tempo was defined as the number of days spent away from home and was measured by summing five categories to create an independent variable *deployed days*. The five categories include operational days, exercise days, unit training days, home station days, and mission support temporary duty (TDY).[40] The independent variable *deployed days* was then tabulated based on the deployment data for the previous 42 months' deployment tempo and further divided into

---

[37] Fricker, *The Effects of Perstempo on Officer Retention in the U.S. Military*, 37.

[38] Ibid., 9.

[39] Ibid., 33.

[40] Aline O. Quester, Anita U. Hattiangadi, and Robert W. Shuford, *Marine Corps Retention in the Post-9/11 Era: The Effects of Deployment Tempo on Marines with and without Dependents* (Alexandria, VA: Center of Naval Analyses, January 2006), 7.

100-day increments. They hypothesized that for every extra 100 days a Marine was deployed in the 42 months prior to the retention decision, the dependent binary variable retention would be affected.[41]

The authors also created a binary variable for crisis operations that captured whether an officer had ever deployed to Afghanistan or Iraq using DMDC crisis deployment information[42]. Based on the periods outlined by the study, operations in Afghanistan and Iraq were considered to be hostile. Both variables were found to be statistically significant in predicting the retention of officers.[43]

In addition, Quester, Hattiangadi, and Shuford found that deployment tempo was positively correlated with retention rates. For all years of service groups, officers were more likely to be retained if they were deployed to a crisis area or the more they deployed. The positive effects between retention and deployment tempo were the same for Marines with and without dependents, and for retirement and non-retirement eligible officers.[44]

2. General Classification Test (GCT) Scores

A Marine's mental ability is an important factor for this thesis for a number of reasons. A Marine who possesses more cognitive ability may have a competitive advantage over other Marines. He or she may be able to achieve higher performance rankings or promote faster. Similarly, Marines with higher cognitive ability may be more likely to seek follow-on education through civilian institutions or through the Naval Postgraduate School. The Marine Corps has a variety of methods to identify Marines with higher cognitive ability for job placement and as a program screener for certain programs, such as aviation. The General Classification Test (GCT) is one such test.

---

[41] Quester, Hattiangadi, and Shuford, *Marine Corps Retention in the Post-9/11 Era: The Effects of Deployment Tempo on Marines with and without Dependents*, 35.

[42] Ibid., 6.

[43] Ibid., 34.

[44] Ibid., 30-31.

The GCT is given to all Marine officers at the beginning of their military careers during TBS as an evaluation tool similar to the Armed Services Vocational Aptitude Battery (ASVAB) and Armed Forced Qualification Test (AFQT). Per MCO 1230.5A, the GCT is designed to evaluate mental abilities.[45] Scores are then recorded in the TFDW database and maintained in the officer's service record. Since the GCT is specifically designed to evaluate mental abilities, this observable variable may be an important proxy to reduce unobserved variable bias due to an individual's mental ability.

In 2008, Bowling, Stimpson, and Hiatt used GCT scores as a variable to show the initial cognitive abilities of an officer at TBS. However, the authors made the clear distinction that this variable could not capture an individual's potential, skills, or capabilities gained over a career.[46] The authors found that there was a statistically significant difference in the mean score between officers who did and did not attend NPS. Summary statistics also showed that GCT scores for Marines at NPS were slightly higher than non-NPS Marines.

Quester and Hiatt created two binary variables using GCT scores as a proxy for ability when analyzing the promotion of officers to the rank of major. The two binary variables used were Upper-Half GCT Scores for scores above 125 and above, and Lower-Half GCT Scores for those who scored 124 and below. The authors found that there was a small, yet significant difference between the promotion rates of officers in each GCT half.[47]

Although Bowman and Mehay did not use GCT scores, they were able to use a similar proxy in their 1998 article, "Graduate Education and Employee Performance: Evidence from Military Personnel." In the article, the authors use an individual's college GPA score as a proxy for cognitive ability of Navy officers. The authors found that college GPA was a statistically significant conditional factor that was correlated with

---

[45] Marine Corps Order 1230.5A Classification Testing, December 15, 2008, 6.

[46] Kirby Bowling, Dan Stimpson with Cathy Hiatt, *The Effect of Naval Postgraduate School (NPS) on the Promotion of Marine Corps Officers* (Alexandria, VA: Center of Naval Analyses, April 2008), 15.

[47] Aline O. Quester and Catherine M. Hiatt, *Final Report: Street-to-Fleet Study. Volume II: Street-to-Fleet for Commissioned Officers* (Alexandria, VA: Center of Naval Analyses, February 2005), 24-25.

ability and the likelihood of someone attending graduate school.[48]   When included with an individual's early performance rating, the coefficient of the binary Master's degree variable in their regression models of promotion was reduced by approximately 20 percent.[49]

3.   Source of Entry

An officer's source of entry is an observable characteristic that provides insights into an officer's education, background, and training.   For instance, an officer commissioned from an enlisted commissioning source has already received a large amount of military specific human capital investment from the Marine Corps by completing boot camp and has a better understanding of the Marine culture and work environment through application of knowledge, skills, and abilities in the FMF. Therefore, prior-enlisted officers should have more information needed to make a career path decision than an officer should from a commissioning program, such as OCC, that provides less military specific training.

Bowman and Mehay used commissioning source as a proxy for affective skills gained before commissioning. The authors found that Naval Academy graduates had a higher promotion probability than all other accession sources, all else equal. Since the Naval Academy is four-year resident program, this finding supports the notion that USNA graduates receive a larger amount of human capital investment compared to other commissioning sources.[50]

In 2006, Doganca found that commissioning sources were statistically significant in determining the survival rates of Army officers in each, year-of-service (YOS) category.[51]   He also found that the type of occupation was a significant factor in

---

[48] William R. Bowman and Stephen L. Mehay, "Graduate Education and Employee Performance: Evidence from Military Personnel," *Economics of Education Review* 18 (1998): 457.

[49] Ibid., 457-48.

[50] Ibid., 456.

[51] Erkan Doganca, *Officer Career Paths and the Effects of Commissioning Sources on the Survival Patterns of Army Officers* (Master's Thesis, Naval Postgraduate School, September 2006), 126-127.

determining the hazard ratios for officers leaving the Army.[52] Similarly, Korkmaz found that each commissioning source had different survival rates for Naval officers and that survival rates varied significantly by designator or occupation.[53]

4. TBS Third Ranking

A Marine's TBS third ranking is significant for a number of reasons. A Marine's ranking is based on a number of factors that capture a Marine's abilities. TBS rankings also represent a Marine's potential fit in the Marine Corps based on the company staff's perceptions of that Marine's attitudes, determination, and potential leadership ability. The end result, as highlighted in Chapter II, is that a Marine's TBS ranking is an important factor in predicting MOS Placement.

Quester, Hattiangadi, Lee, and Shuford found that officers ranked in the top third of their TBS class were more likely to be retained over time. Similarly, Wiler and Hurndon found that officers in the top third of their TBS class received higher fitness report evaluations than officers in the middle third. Officers in the middle third, likewise, received higher scores than officers in the lower third of the same TBS class.[54]

Bowling, Stimpson, and Hiatt found that officers in the top and lower thirds of their TBS class who also graduated from NPS are less likely to be promoted to lieutenant colonel than their peers in the same third. However, officers who were in the middle third of their TBS class and attended NPS fared better for promotion to lieutenant colonel than their peers in the same third.

McHugh et al., used a Marine's TBS graduation third as a proxy for officer quality in their regression analysis of promotion rates. They found that there are substantial differences in quality across PMOSs for Marines that are in-zone for

---

[52] Doganca, *Officer Career Paths and the Effects of Commissioning Sources on the Survival Patterns of Army Officers*, 125-127.

[53] Ibrahim Korkmaz, *Analysis of the Survival Patterns of United States Naval Officers* (Master's Thesis, Naval Postgraduate School, March 2005), 109.

[54] Darby Wiler and Nicholas Hurndon. An Analysis of Performance at The Basic School as a Predictor of Officer Performance in the Operating Forces (Master's Thesis, Naval Postgraduate School, March 2008), 89.

promotion for captain, major, lieutenant colonel, and colonel.[55] Nine MOSs had more than 40% of an in-zone population that was in the lower TBS third. Also six MOSs that had more than 40% of the in-zone population were in the top TBS third. The authors also used MOS preferences to determine differences in MOS preferences across TBS thirds. They found that 48% of Marines in the top third chose PMOS 0302 (Infantry Officer) vice only 22% of Marines in the bottom third. They conclude that Marines in the top TBS third choose MOSs significantly differently from Marines in the lower third.[56]

Quester and Hiatt created binary variables for each TBS third to proxy for officer quality in their analysis of promotion rates of Marine Corps officers to the rank of major. The authors found a strong positive association between TBS third and promotion to major. Officers in the top third had a 43.6% chance of reaching major vice only 22.1% for officers in the lower third.[57]

5.   Length of Service

Since the Marine Corps operates under a closed loop personnel system with substantial retirement incentives for those officers who make it to the 20-year vesting point, total length of service may affect a Marine's decision process to stay.

Quester, Hattiangadi, and Shuford analyzed the effects of deployment tempo on retention of Marines with and without dependents by dividing each group into years of service categories. The study analyzed officers making a retention decision between March 2004 and March 2005.[58] The year of service (YOS) categories included 4 to 6 years of service, 9 to 11 years of service, 12 to 18 years of service, and retirement eligible

---

[55] Cathleen M. McHugh, Holly A. Potter, Maj. Dan Stimpson, USMC, Michael J. Moskowitz, and Aline O. Questor with Dana L Samuelson and Ian D. MacLeod, *Analyses of the Marine Corps Officer Manpower System: Final Report* (Alexandria, VA: Center of Naval Analyses May 2006), 64-65.

[56] Ibid., 67.

[57] Quester and Hiatt, *Final Report: Street-to-Fleet Study. Volume II: Street-to-Fleet for Commissioned Officers*.

[58] Quester, Hattiangadi, and Shuford, *Marine Corps Retention in the Post-9/11 Era: The Effects of Deployment Tempo on Marines with and without Dependents*, 3.

officers.[59] There were distinct differences in the retention of officers depending on their YOS group. The authors noted that the largest drops in retention occurred at the end of the 4 to 6, the 9 to 11, and retirement-eligible years of service categories.[60]

Hansen and Moskowitz used years of service as an independent variable when analyzing the retention of aviators in their research article, "The Effect of Compensation on Aviator Retention." Based on the available sample, the authors created binary variables for years of service between three and 13 years. They found a negative relationship between retention and the time a person spent in the Navy. The longer a person spent in the Navy before completing the minimum service requirement, the less likely that person would stay in the Navy.[61]

6.   Occupational Group

Although a Marine may have a specific preference for an individual MOS, he or she may also have a preference for a community of MOS's that may affect future career decisions based on that community's culture or perceptions of a typical career path for advancement. Bowling, Stimpson, and Hiatt found that a Marine's occupational field was important in predicting both participation at NPS and probability of promotion. A combat arms MOS, such as 0302 infantry, had lower participation rates at NPS. Likewise, MOS 0302 officers who graduated from NPS had a lower probability of promoting to lieutenant colonel. The author's attribute this to the heavy requirements for these career tracks to gain operational experience. Occupational fields such as Finance or Supply, which may be more closely aligned to their degrees and have higher returns to education, fared much better for promotion and NPS attendance.[62]

---

[59] Quester, Hattiangadi, and Shuford, *Marine Corps Retention in the Post-9/11 Era: The Effects of Deployment Tempo on Marines with and without Dependents*, 37.

[60] Ibid., 26.

[61] Michael L. Hansen, and Michael J. Moskowitz, *The Effect of Compensation on Aviator Retention* (Alexandria, VA: Center of Naval Analyses, November 2006), 68.

[62] Bowling, Stimpson, and Hiatt, *The Effect of Naval Postgraduate School (NPS) on the Promotion of Marine Corps Officers*, 27-30.

D.   SUMMARY

Based on the literature reviewed, the retention models used in the literature define the retention variable at the 6-year point from an officer's date of commissioning. The 6-year decision point is inclusive for all commissioning sources and provides a sufficient buffer to exclude officers who wish to leave the military, but do not have the opportunity to leave exactly upon the expiration of obligated service.

Also many observable variables may affect a Marine's decision to stay in the military and/or to seek an alternative career path. A Marine's retention and career path decisions are complex and cannot fully be predicted due to the scope of unobservable factors, which affect each individual. The point of this thesis is to use variables that may have a significant impact on those decisions and to use variables that have proven to be significant factors in other studies. The variables listed in this review represent credible factors, such as an officer's total amount of deployment days, TBS third ranking, GCT scores, source of entry, length of service, and occupational group, that may affect an officer's choice to remain in the military or seek an alternative career path based on that officer's MOS placement.

IV. DATA SOURCES, VARIABLE DESCRIPTIONS, AND SUMMARY STATISTICS

There are several purposes for this chapter. The first is to provide background information on the data used to conduct the statistical analysis. The second is to provide information on the variables used such as variable definitions and summary statistics from the samples. Finally, this chapter will provide an overview of the data using key variable tabulations and descriptive statistics.

A. DATA SOURCES

1. Center of Naval Analyses (CNA) Officer File

The Center of Naval Analyses (CNA) collects and stores panel data for Marine officers. The database contains general demographic information on newly commissioned officers, such as race, gender, marital status, number of dependents, and TBS performance information, such GCT scores, graduating third, military performance variables, and TBS class academic rankings, military skills, and leadership rankings. As each individual progresses in his or her career, information is recorded on pay grade, rifle and pistol scores, physical fitness test scores, and date of rank for each progressive rank up to the rank of lieutenant colonel.

The database also includes general information on each individual's TBS class size, commissioning source, top three MOS preferences, and PMOS held at each rank. The annual range for the TBS file is from 1980 to 2006. Since the TBS Officer File consists of only officer data, this file was used as the master file for merging additional datasets. An individual that does not match the TBS file has been dropped from the sample.

2. Total Force Data Warehouse (TFDW) Dataset

The TFDW database contains information for all officer and enlisted Marine personnel. The TFDW data used for this thesis consist of several smaller datasets that

were merged to the TBS Officer File. The cumulative TFDW Officer File includes officer demographics, commissioning sources, and officer service information. This file also includes years of service, pay entry base dates, and days deployed during the Global War on Terrorism (GWOT) and during peacetime.

B.   RETENTION SAMPLE DESCRIPTIVE STATISTICS

The retention model sample consists of approximately 5,922 Marine ground officers from TBS fiscal year cohorts 1994 to 1999 and 2001 to 2002. The original data file contained fiscal year cohorts 1980 to 2006. However, fiscal years 1980 to 1993 and 2000 were excluded from the sample because those years did not have any MOS preference information. Since the models examine retention for junior officers to the 5-year and 6-year decision points, fiscal years 2003 to 2006 were excluded because officers in these cohorts have not yet had the opportunity to reach the 5-year or 6-year decision points. Table 1 provides general information on the cumulative sample.

Table 1.   Retention Model Sample General Information

Details	Number of Observations	% of Sample
Initial Sample	37,080	100%
Missing or Deleted	31,158	84.0%
Final Sample	5,922	16.0%

C.   VARIABLE DESCRIPTIONS AND DESCRIPTIVE STATISTICS

This section provides an overview of each variable along with its definition in Table 2 and descriptive statistics in Table 3 for each dependent and independent variable. Military Occupational Specialties such as aviators, judge advocates, and warrant officers are excluded from the sample and are not included in either table. Likewise, officers who were listed as deceased while on duty were excluded from the sample, and not included in either table, since these officers may or may not have had the opportunity to reach the retention decision point. This group represents a very small portion of the initial sample. Officers who were commissioned from MCP, MECEP, or ECP were also excluded from the sample, since these officers will have a longer length of total service and may be

driven by other factors, such as retirement, when making a retention decision. Therefore, the MCP, MECEP, and ECP officers will be distinctly different from other officers in the sample.

Note that for each of the key independent variables, such as gender, race, marital status, TBS third, occupational field, and total MOS preference received, the total percentage of the sample for each category cumulatively equals 100 percent. For these key variables, missing or incomplete information was deleted from the sample. Specific information and qualifications for each variable are outlined below.

Table 2.   Overview of Each Variable

Category	Variable Description	Variable	Variable Type	Range
DEPENDENT				
	Retention to the 5-year point	Retained	Binary	1=Retained 0=otherwise
	Retention to the 6-year point	Retained	Binary	1 = Retained 0 = otherwise
INDEPENDENT				
Demographics	Gender	Female	Binary	1 = Female 0 = Male
		Male	Binary	1 = Male 0 = Female
	Race/Ethnicity	White	Binary	1 = White 0 = otherwise
		Black	Binary	1 = Black 0 = otherwise
		Asian	Binary	1 = Asian 0 = otherwise
		Hispanic	Binary	1 = Hispanic 0 = otherwise
		AIAN	Binary	1=American Indian/Alaska Native 0=otherwise
		NHPI	Binary	1=Native Hawaiian/Pacific Islander 0=otherwise

Category	Variable Description	Variable	Variable Type	Range
		RaceDeclined	Binary	1=Declined Race 0=otherwise
	Marital Status	Married	Binary	1 = Married 0 = otherwise
		Single	Binary	1 = Single 0 = otherwise
		Divorced	Binary	1 = Divorced 0 = Otherwise
	Number of Dependents	Dependents	Continuous	Add 1 for each dependent
Service Info	Commissioning Source	USNA	Binary	1 = USNA officer 0 = otherwise
		NROTC	Binary	1 = NROTC officer 0 = otherwise
		PLC	Binary	1 = PLC officer 0 = otherwise
		OCC	Binary	1 = OCC officer 0 = otherwise
		MECEP	Binary	1 = MECEP officer 0 = otherwise
		ECP	Binary	1 = ECP officer 0 = otherwise
		MCP	Binary	1 = MCP officer
	TBS Third	Top	Binary	1 = Top Third grad 0 = otherwise
		Middle	Binary	1 = Middle Third grad 0 = otherwise
		Lower	Binary	1 = Bottom Third grad 0 = otherwise
	GCT Score	GCT	Continuous	Add 1 for each additional point scored
	MOS Preference Received	First MOS	Binary	1 = Received 1st MOS choice 0 = otherwise
		Second MOS	Binary	1 = Received 2nd MOS choice 0 = otherwise
		Third MOS	Binary	1 = Received 3rd MOS choice 0 = otherwise

Category	Variable Description	Variable	Variable Type	Range
		Other MOS	Binary	1 = Did not receive one of first 3 MOS choices 0 = otherwise
	Occupational Field	Combat Arms	Binary	1 = Combat Arms MOS 0 = otherwise
		Combat Service Support	Binary	1 = CSS MOS 0 = otherwise
		Air-Ground Support	Binary	1 = Air-Ground Support MOS 0 = otherwise
	Primary Military Occupational Specialty	Primary MOS Code	Binary	1 = PMOS 0 = otherwise
	Total GWOT and Non-GWOT Days Deployed	Days Deployed	Continuous Or Incremental	100 Day Increments
	Education Status	civmasters	Binary	1=Ever Earned a Master's Degree 0=otherwise
	Wounded in Action Status	WIA	Binary	1=Wounded in Action 0=otherwise
	Retention Year Dummies	FY_00 to FY_08	Binary	1 = Fiscal Year 0 = otherwise

Table 3.   Descriptive Statistics for All Variables

Variable	Mean	Std. Dev.
Female	0.09	0.29
Male	0.91	0.29
White	0.78	0.41
Black	0.09	0.29
Hispanic	0.08	0.26
Asian	0.02	0.13
AIAN	0.00	0.07
NHPI	0.00	0.03
RaceDeclined	0.03	0.16

Variable	Mean	Std. Dev.
o2_married	0.43	0.50
o2_single	0.55	0.50
o2_divorced	0.02	0.15
o2_depndts	0.68	1.05
GCT	124.32	9.80
civmasters	0.10	0.30
Top	0.32	0.47
Middle	0.31	0.46
Lower	0.37	0.48
First MOS	0.43	0.50
Second MOS	0.14	0.35
Third MOS	0.09	0.29
Top3MOS	0.66	0.47
OtherMOS	0.34	0.47
m0302	0.22	0.42
m0802	0.09	0.29
m1302	0.05	0.21
m1802	0.02	0.14
m1803	0.01	0.12
Combat Arms	0.39	0.49
m0180	0.05	0.21
m0202	0.00	0.03
m0203	0.03	0.18
m0204	0.01	0.08
m0206	0.02	0.14
m0207	0.02	0.14
m0402	0.12	0.32
m0602	0.07	0.25
m2501	0.00	0.06
m2502	0.01	0.11
m3002	0.08	0.27
m3404	0.03	0.17
m3502	0.02	0.14
m4002	0.01	0.09
m4302	0.01	0.11
m5803	0.02	0.14
Combat Service Support	0.50	0.50
m6002	0.03	0.17
m6602	0.02	0.14
m7204	0.01	0.09
m7208	0.02	0.16

Variable	Mean	Std. Dev.
m7210	0.02	0.13
m7220	0.01	0.11
m7201	0.00	0.04
Aviation Ground Support	0.11	0.31
OCC	0.29	0.46
PLC	0.30	0.46
NROTC	0.26	0.44
USNA	0.14	0.35
fy_94	0.11	0.32
fy_95	0.12	0.33
fy_96	0.10	0.31
fy_97	0.15	0.35
fy_98	0.14	0.35
fy_99	0.15	0.36
fy_01	0.13	0.34
fy_02	0.09	0.28
WIA	0.02	0.12
Prior Enlisted	0.14	0.35
daysdepl	3.22	2.99
5-Year Retained	0.80	0.40
USNARetained	0.19	0.39
Total Observations		5922

1. Retention Dependent Variable

Since neither the TFDW nor the CNA datasets contained valid information on the specific separation date for each officer, the binary retention variables were constructed using the dates of rank variables provided in the CNA file. Each officer's second lieutenant date of rank was used to mark the date of first commissioning. Elapsed time from the date of first commission was then created for each subsequent rank. For example, elapsed time was measured between the date of commissioning to the rank of O-2, the date of commissioning to the rank of O-3, and the date of commissioning to the rank of O-4. Since some officers may not promote to each of the ranks listed above, the elapsed time had to be measured for each rank.

For the five-year model, the officer receives a value of 1 for the Five-Year Retained variable if the officer was commissioned from NROTC, PLC, or OCC and the officer's total years of service for any rank equaled or exceeded five years. The officer receives a value of 0 for the Five-Year Retained variable if the officer's total years do not exceed five years. For the six-year model, the officer receives a value of 1 for the USNA Retained variable if the officer was commissioned from the USNA and the officer's total years of service for any rank equaled or exceeded 6 years. Likewise, the officer receives a value of 0 for the USNA Retained binary variable if his or her total elapsed years of commissioned service were less than 6 years.

The five-year decision point for retention is based on the four-year minimum service requirement for NROTC, PLC, and OCC graduates plus one additional year to account for variance in operational commitments or service extensions. The Five-Year Retained variable is defined as:

1 = if officer has 5 years or more of commissioned service

0 = if officer has less than 5 years of commissioned service

The six-year decision point for retention is based on the five-year minimum service requirement for Naval Academy graduates plus one year to account for variance in operational commitments or service extensions. To summarize, the binary variable USNA Retained is defined below.

1 = if officer has 6 years or more of commissioned service

0 = if officer has less than 6 years of commissioned service

Based on the sample summary statistics, approximately 4,039 of the 5,073 five-year officers remained in the Marine Corps beyond the five-year MSR, while only 173 of the 676 six-year sample stayed in the Marine Corps beyond the six-year MSR. This represents a 79.6% retention rate for NROTC, PLC, and OCC and only a 25.6% retention rate for USNA graduates.

2. Demographic Independent Variables

a. *Gender*

The two gender variables, M and F, used in this thesis were constructed using information from the CNA Officer File. This variable was chosen over other gender variables from the TFDW data file because CNA file offered complete observations for each officer. Based on the final sample, approximately 9% of the sample is female and 91% is male.

b. *Race/Ethnicity*

There are several variables in both the CNA Officer File and TFDW datasets that describe an officer's race or ethnicity. The ethnicity terms categorize individuals on approximately 28 separate ethnic categories, while the race variables for both datasets have six categories, denoting American Indian/Alaska Native, Asian, Black/African American, Native Hawaiian/Pacific Islander, White and declined to respond. One key downside of using the race variable is that it does not have a category for Hispanics. However, the CNA file does have two separate dummy variables for Blacks and Hispanics.

Combining information from both variables, I constructed race/ethnicity indicators, consisting of the following categories: White, Black, Hispanic, Asian, American Indian and Native Alaskan, Native Hawaiian and Pacific Islander, and Declined to Respond. Even though the Native American/Alaska Native variable represented only 29 observations and the Native Hawaiian/Pacific Islander variable represented only five observations, these categories were maintained in the sample. Likewise, the officers who declined to respond for the race category were also included under the RaceDeclined variable. Any missing observations were then dropped from the sample. From the data, Whites compose the majority of the sample with 4,627, followed by 544 Blacks, 449 Hispanics, 160 RaceDeclined, 108 Asians, 29 American Indian and Alaska Native, and five Native Hawaiian and Pacific Islander. The sample by percentage

is as follows: 78% White, 9% Black, 8% Hispanic, 3% RaceDeclined, 2% Asian, less than 1% American Indian and Alaska Native, and less than 1% Native Hawaiian and Pacific Islander.

c.   Marital Status

The marital status variable is divided among three categories and is defined as single, married, and divorced. There were no observations of officers under the categories of annulled or legally separated. Since many officers change their marital status after commissioning and some officers may not reach the rank of O-3, the author chose to use the marital status at the officer's promotion to O-2. This point was also chosen because many officers will make the decision to retain prior to reaching the actual 5-year or 6-year decision points. Thus, the officer's marital status at the O-2 rank may be in the proper range for the retention decision and may play an important role in its decision. From the basic sample summary statistics, approximately 55% of the officers at the rank of O-2 are single, while only approximately 43% are married.

d.   Number of Dependents

The number of dependents variable is a cumulative variable that measures the total number of dependents as recorded in the CNA Officer File at an officer's promotion to O-2. Each dependent is counted as one. For example, a Marine with three dependents would have a value of 3 for this variable.

3.   Service Independent Variables

a.   Commissioning Source Variables

The commissioning source variables are a group of binary variables that record each officer's commissioning source. Background information on each commissioning source can be found in Chapter II of this thesis.

Both the CNA Officer and TFDW files provide variables denoting an officer's commissioning source. The final binary terms were constructed using two sources of entry variables from the CNA file. The first variable provides very clear source of entry information based on only seven categories. However, this variable was incomplete for the sample and represented only approximately one-forth of the total officers. The second variable was very detailed, offering information for approximately one hundred sources of entry categories, including types of commissioning sources, programs, and contracts. In many cases, the variable categories did not match a specific source of entry, were too vague, or were outdated. These observations were recoded as missing before matching them to the first variable. Any missing sources of entry were then dropped from the sample. Dummy variables were also created, based solely off the seven commissioning sources outlined in Chapter II of this thesis.

In some cases, such as the enlisted commissioning programs, an individual may have participated in multiple programs, such as ECP and OCC. In these cases, individuals were recoded to denote the enlisted commissioning program vice OCC, since ECP outlines more specifically an officer's amount of human capital investment and OCC is effectively the officer's training at Officers Candidate School. The following outlines each binary variable.

NROTC   = 1 if commissioned via NROTC, 0 if not

PLC   = 1 if commissioned via PLC, 0 if not

OCC   = 1 if commissioned via OCS, 0 if not

USNA   = 1 if commissioned via the Naval Academy, 0 if not

The mean commissioning source values in Table 3 represent the percentages of officers from each commissioning source included in the sample. From the summary statistics, PLC has the highest participation rate at approximately 30%, followed by OCC at 29%, NROTC at 26%, and USNA at 14%. As outlined above, an individual who went to ECP, may have been coded as an OCC participant in either the

CNA or TFDW files. For those Marines who may have appeared in multiple commissioning sources across the dummy variables, the enlisted commissioning programs were used as the default vice OCC or PLC. This assumption was able to correct some observations, but it is impossible to resolve the miscoding problem completely.

Based on current participation rates advertised on the MarineOfficer.com webpage for the Marine Corps recruiting command, commissioning source participation rates are as follows: 35% PLC, 24% OCC, 15% NROTC, and 14% USNA.[63] The sample may be overrepresented for OCC and NROTC graduates, but underrepresented by PLC. Even though some programs may be over or underrepresented, this does not detract from the regression models since the main focus of this thesis is to determine the effect of MOS placement on retention, not the amount of early human capital investment on retention.

b. *TBS Graduation Third*

The CNA dataset contains information on which TBS class third an officer was placed in for his or her graduating class. A binary variable was created for each third using the following logic.

Top = 1 if officer was in the top 1/3 of a TBS class, 0 if not

Middle = 1 if officer was in the middle 1/3 of a TBS class, 0 if not

Lower = 1 if officer was in the lower 1/3 of a TBS class, 0 if not

Based on the descriptive statistics in Table 3, the Top, Middle, and Lower thirds do not exactly match the theoretical third distribution outlined in Chapters I and II of this thesis. The top third represents 32%, the middle 31%, and the lower 37 percent. This variance is due to several factors. The first is that TBS classes vary in size and will not be exactly divisible by one third. The second is that the TBS company staff has some

---

[63] Marine Corps Recruiting Command, http://www.MarineOfficer.com/page/Earning-a-Commission-O (accessed January 4, 2009).

leeway in dividing each class, providing an option to increase or decrease the distribution based on staff preferences. Based on the sample above, it appears that the tendency is to group more officers in the lower third.

c.   Prior Enlisted Variable

There are no specific prior enlisted variables in either the CNA Officer File or TFDW data files; however, several categories within existing variables indicate a Marine's enlisted service record. Using the commissioning source, any officer commissioned from MCP, MECEP, or ECP would have enlisted service prior to commissioning. Any officer who participated in one of these categories was denoted as prior enlisted; however, these commissioning sources do not provide information on every prior enlisted officer.

Officers commissioned through the Naval Academy or NRTOC could have prior enlisted service in either the Navy or Marine Corps. Officers who accumulated over three years of enlisted service acquire an enlisted designator "E" on their company grade rank through the rank of captain. This characteristic is denoted as an O-1E, O-2E, or O-3E. Using the present grade category, any officer with an "E" designator is coded as a prior enlisted service member. Approximately 14% of the officers in the sample have prior enlisted experience. The following outlines the definition of the prior enlisted binary variable.

Prior   = 1 if the officer was prior enlisted, 0 if not

d.   MOS Preference Received

Before MOS placement, each officer will list his or her preferences in numerical order from most preferable to least preferable for the MOS's available. The CNA maintains MOS preferences for each Marine for the first three MOS preferences. Using these preferences and the Marine's actual MOS placement, the author created

39

binary variables capturing whether an officer had received one of his or her top three preferences or had received an MOS outside of his or her top preferences by matching these preferences to the officer's actual PMOS received.

To execute this, the author chose to use the officer's PMOS at the rank of O-2. By this point in their careers, many officers will have completed their PMOS School and be designated with their PMOS code vice a student MOS code. In some cases, officers retained the student MOS code. The author assumes that these officers successfully completed their MOS schools and recoded any student MOS's with the correlating PMOS code.

One limitation is that the CNA Officer File only has MOS preference information for fiscal years 1994-1999, 2001 and 2002. Since the primary research question involves only those officers who have reached the 5-year or 6-year retention decision points, officer cohorts later than 2002 were excluded.

First MOS   = 1 if the Marine received his/her first MOS, 0 if not

Second MOS = 1 if the Marine received his/her second MOS, 0 if not

Third MOS   = 1 if the Marine received his/her third MOS, 0 if not

Top3MOS   = 1 if the Marine received one of their top 3 MOS preferences,

                     0 if not

OtherMOS   = 1 if the Marine did not receive one of their top MOS preferences,

                     0 if not

The TBS website states that, on average, approximately 75% of each graduating class has received an MOS within his or her top three MOS preferences, 83% will receive on of their top five preferences, and 93% will receive one of their top 10 MOS preferences.[64] Based on the summary statistics, approximately 67% of officers receive one of their top three MOS preferences. The remaining 33% did not receive an

---

[64] The Basic School, http://www.tbs.usmc.mil/All_MOS_Assignment_Process.

MOS within their top three MOS preferences. The average variance between the advertised percentage and the sample percentage may be due to a number of factors. One factor may be due to the omission of pilots and JAG officers. Another factor may be due to improved job placement over time due to policy changes, such as optimization. When summarized by TBS fiscal year, the average for receiving a top three MOS choices for 2001 and 2002 is approximately 71 percent. For 1994 to 1999, the average is approximately 64 percent.

e. *Occupational Field*

Occupational fields are groupings of like MOSs that serve similar purposes in the Marine Corps. As described in Chapter I of this thesis, these fields represent a broader community rather than one specific PMOS. The three occupational fields of interest for this thesis are Combat Arms (CA), Combat Service Support (CSS), and Air-Ground Support (AGS). If an officer's PMOS received matches one of the MOS's within an occupational field, the officer will be coded with 1 for that occupational field.

This variable is introduced to account for differences across service communities that may either entice or discourage someone from selecting that MOS as a career opportunity. For instance, an individual may list a combat arms MOS for each of his or her top MOS choices in hopes of entering that type of community. Contrarily, some officers may find they dislike the combat arms environment from their experiences at TBS and choose a different community in hopes of avoiding the combat arms occupational field.

The definition for each variable is listed below.

CA = 1 if PMOS code equals 0302, 0802, 1302, 1802, 1803, zero if otherwise

CSS = 1 if PMOS code equals 0180, 0203, 0204, 0206, 0207, 0402, 0602,

3002, 3404, 4302, 5803, zero if otherwise

AGS = 1 if PMOS code equals 6002, 6602, 7204, 7208, 7210, 7220, zero if

otherwise

Based on the sample, approximately 50% of the sample goes into the CSS occupational field, while 39% go into CA, and 11% go into AGS. The CA occupational field has the smallest number of MOS's but the largest number of billets per each MOS. The CSS community has the largest number of MOS's but a smaller amount of billets per each MOS. The AGS occupational field has a small number of MOS's and a small numbers of billets within each MOS.

f.   Primary MOS

The primary MOS category includes binary variables for each of the PMOSs available to officers who graduate TBS and is based on an individual's actual MOS assignment. This field is designed to capture occupational characteristics that may affect an individual's retention and career path decisions. A complete list of the variable definitions is provided below.

0180   = 1 if the officer has a 0180 PMOS, 0 if not

0202   = 1 if the officer has a 0202 PMOS, 0 if not

0203   = 1 if the officer has a 0203 PMOS, 0 if not

0204   = 1 if the officer has a 0204 PMOS, 0 if not

0206   = 1 if the officer has a 0302 PMOS, 0 if not

0207   = 1 if the officer has a 0302 PMOS, 0 if not

0302   = 1 if the officer has a 0302 PMOS, 0 if not

0402 = 1 if the officer has a 0402 PMOS, 0 if not

0602 = 1 if the officer has a 0602 PMOS, 0 if not

0802 = 1 if the officer has a 0802 PMOS, 0 if not

1302 = 1 if the officer has a 1302 PMOS, 0 if not

1802 = 1 if the officer has a 1802 PMOS, 0 if not

1803 = 1 if the officer has a 1803 PMOS, 0 if not

3002 = 1 if the officer has a 3002 PMOS, 0 if not

3404 = 1 if the officer has a 3404 PMOS, 0 if not

4302 = 1 if the officer has a 4302 PMOS, 0 if not

5803 = 1 if the officer has a 5803 PMOS, 0 if not

6002 = 1 if the officer has a 6002 PMOS, 0 if not

6602 = 1 if the officer has a 6602 PMOS, 0 if not

7204 = 1 if the officer has a 7204 PMOS, 0 if not

7208 = 1 if the officer has a 7208 PMOS, 0 if not

7210 = 1 if the officer has a 7210 PMOS, 0 if not

7220 = 1 if the officer has a 7220 PMOS, 0 if not

g. *Days Deployed*

The days deployed variable derived from the TFDW's database for Global War on Terrorism (GWOT) and Non-Global War on Terrorism days deployed. For each category in the TFDW, days deployed are measured by one day increments. To simplify the data range and provide a more realistic quantity, the days deployed variable was constructed to measure the total amount of time a Marine is deployed in 100 day increments by adding the GWOT and Non-GWOT days deployed. If a Marine's total

number of deployed days exceeds a 100-day increment, the variable is rounded to the next highest number. For example, a Marine deployed for a total of 350 days would have a 4 recorded for the days deployed variable.

h. TBS Cohort Years

Since the primary thesis question involves the impacts of job placement on retention, binary variables were created for each of the TBS cohort fiscal years. These fiscal year dummy variables account for differences in the economy or service that may be unobservable at the point the officer enters the Marine Corps. The first year dummy starts at the 1994-year cohort. The last year dummy is for the 2002-year cohort. The total range is from 1994-1999 and from 2001 to 2002. Fiscal year 2000 was excluded from the range, since there were no MOS preferences for that TBS cohort.

D. CROSS-TABULATIONS BY TBS THIRD, GENDER, RACE, AND FISCAL YEAR

1. Key Variables by TBS Third

There are several key differences between observable characteristics across the TBS thirds. The first difference is gender. The percentage of each third that is female progressively gets larger as the third rank lowers. Approximately 4% of the top, 7% of the middle, and 15% of the lower third is composed of females. This suggests that females do not perform as well as males at TBS. Another variable is race/ethnicity. Whites make up approximately 88% of the top third, 83% of the middle, and only 65% of the lower third. This difference suggests that Whites perform better at TBS than other races/ethnicities.

The mean GCT scores for each TBS third also shows that academic ability may be related to an officer's TBS performance, since officers scored 128.4 on average in the top, 124.8 in the middle, and 120.4 in the lower. Since academic scores make up a

significant portion of an officer's cumulative ranking, it is practical that an officer's GCT scores are positively related to his or her academic performance, and thus, the officer's TBS third.

The largest numbers of prior enlisted Marines were ranked in the top third of their TBS graduating classes, which suggests that prior enlisted Marines may have a competitive advantage over other officers due to their previous experiences, education, and training as enlisted Marines. Likewise, Marines in the top third appear to receive their top MOS preferences more often on average than the middle or lower thirds. The number of days deployed, however, did not vary substantially over each third. Finally, the top third has the highest retention rate of any third, followed by the middle, and lower third groups for both MSR groups.

Table 4 provides overall summary statistics of each key variable by TBS third.

Table 4.   Key Variables by TBS Third

Variable	Top TBS Third		Middle TBS Third		Lower TBS Third	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Female	0.04	0.20	0.07	0.26	0.15	0.36
Male	0.96	0.20	0.93	0.26	0.85	0.36
White	0.88	0.32	0.83	0.38	0.65	0.48
Asian	0.01	0.10	0.02	0.13	0.03	0.16
Black	0.04	0.19	0.06	0.24	0.16	0.37
Hispanic	0.05	0.21	0.06	0.24	0.11	0.31
AIAN	0.00	0.07	0.00	0.06	0.01	0.08
NHPI	0.00	0.03	0.00	0.02	0.00	0.03
RaceDeclined	0.02	0.13	0.02	0.15	0.04	0.19
o2_married	0.50	0.50	0.42	0.49	0.38	0.49
o2_single	0.48	0.50	0.56	0.50	0.60	0.49
o2_divorced	0.02	0.14	0.02	0.13	0.03	0.16
o2_depndts	0.84	1.16	0.63	1.00	0.58	0.96
GCT	128.43	9.76	124.76	9.12	120.43	8.81
civmasters	0.12	0.32	0.10	0.30	0.09	0.29
OCC	0.39	0.49	0.29	0.45	0.22	0.41
PLC	0.22	0.41	0.30	0.46	0.39	0.49
NROTC	0.23	0.42	0.27	0.45	0.27	0.44
USNA	0.16	0.37	0.14	0.35	0.13	0.33

Variable	Top TBS Third		Middle TBS Third		Lower TBS Third	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Prior Enlisted	0.21	0.41	0.12	0.32	0.10	0.30
daysdepl	3.33	2.87	3.22	2.97	3.12	3.10
WIA	0.03	0.16	0.01	0.12	0.01	0.08
First MOS	0.54	0.50	0.43	0.50	0.34	0.47
Second MOS	0.12	0.33	0.15	0.35	0.15	0.36
Third MOS	0.07	0.26	0.09	0.28	0.11	0.32
Top3MOS	0.73	0.44	0.66	0.47	0.60	0.49
OtherMOS	0.27	0.44	0.34	0.47	0.40	0.49
5-Year Retained	0.84	0.37	0.80	0.40	0.77	0.42
USNARetained	0.22	0.42	0.17	0.38	0.16	0.37
		1886		1838		2198

2. Key Variables by Gender

There are several significant gender differences between the key independent variables. The racial spread for males closely follows the overall cumulative sample percentages. Females are slightly more likely to be from a minority group and are also more likely to be single and divorced than males. When comparing males and females by GCT scores, females score on average 1.73 points lower than males.

One of the most significant differences appears when comparing males and females by TBS third. Females are much more likely to rank in the middle to lower thirds than males. Based on the sample, approximately 62% of females rank in the lower third. Conversely, males are relatively evenly divided across each TBS third.

When compared by commissioning sources, females have a higher rate of participation for OCC at 33% compared to just 29% for males. Likewise, the USNA as a source of entry is more prevalent for females than males. Approximately 21% of female officers receive a commission from the USNA versus only 14% of male officers. The NROTC program appears to have the largest disparity between males and females as a commissioning source. Approximately 27% of males enter the Marine Corps from NROTC, vice only 13% of females.

Based on general service information, females are slightly less likely to have prior enlisted experience. Approximately 12% of female officers are prior enlisted, while approximately 15% of the male sample is composed of prior enlisted officers. Female officers also have a lower total deployed time on average than male officers. Since the deployed days variable includes officers who may not have deployed, the mean shows only the deployed time for the specific sample gender. The mean does not show the average length of time for those who actually deployed. This variance suggests that females are either deployed less or for a shorter amount of time on average than males.

Lastly, females are less likely to receive their first MOS preference when compared to males. Approximately 34% of females receive their top MOS preference as compared to 44% of males. However, females are slightly more likely to receive one of their second or third MOS preferences than males. For those Marines who receive an MOS outside of his or her top three MOS preferences, the difference is negligible at approximately 33% for females and 34% for males.

Table 5.   Key Variables by Gender

Variable	Females Mean	Std. Dev.	Males Mean	Std. Dev.
White	0.74	0.44	0.79	0.41
Asian	0.02	0.14	0.02	0.13
Black	0.12	0.32	0.09	0.29
Hispanic	0.08	0.27	0.08	0.26
AIAN	0.00	0.06	0.01	0.07
NHPI	0.00	0.00	0.00	0.03
RaceDeclined	0.04	0.20	0.03	0.16
o2_married	0.30	0.46	0.44	0.50
o2_single	0.64	0.48	0.54	0.50
o2_divorced	0.06	0.23	0.02	0.13
o2_depndts	0.24	0.58	0.73	1.07
GCT	122.75	10.03	124.48	9.76
civmasters	0.12	0.33	0.10	0.30
Top	0.14	0.35	0.34	0.47
Middle	0.24	0.43	0.32	0.47
Lower	0.62	0.49	0.35	0.48
OCC	0.33	0.47	0.29	0.45

	Females		Males	
Variable	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
PLC	0.33	0.47	0.30	0.46
NROTC	0.13	0.34	0.27	0.45
USNA	0.21	0.41	0.14	0.34
Prior Enlisted	0.12	0.32	0.15	0.35
daysdepl	2.46	2.94	3.29	2.98
WIA	0.00	0.04	0.02	0.13
First MOS	0.34	0.48	0.44	0.50
Second MOS	0.19	0.39	0.14	0.34
Third MOS	0.14	0.35	0.09	0.28
Top3MOS	0.67	0.47	0.66	0.47
OtherMOS	0.33	0.47	0.34	0.47
5-Year Retained	0.80	0.40	0.80	0.40
USNARetained	0.13	0.34	0.19	0.39
Total Observations		546		5376

3.   Key Variables by Race/Ethnicity

Tabulating the key independent variables by race/ethnicity shows clear variations across several important variables. The first is between the mean GCT scores. On average, Whites scored 125.68 on the GCT. While Asians scored fairly close to Whites on average at 122.22, Blacks scored 117.36 and Hispanics scored 119.55 on average. Since GCT scores provide an insight into an individual's cognitive abilities, individuals who score higher on the GCT may score higher on academic examinations. Since academic scores comprise a significant portion of a student officer's cumulative ranking at TBS, officers who score higher on the GCT may have a higher class rank, and therefore, reach a higher TBS third.

When the races/ethnicities were compared across TBS thirds, Whites had a relatively even distribution, with a slight prevalence to be ranked in the top third. Non-Whites, however, do not have the same even distribution. Non-Whites are much more prevalent to rank in the lower and middle TBS thirds. Based on the sample, 66% of Black Marine officers will rank in the lower third. Approximately 54% of Hispanic officers and 51% of Asian officers will rank in the lower third.

The distribution of officers into each of the sources of entry is much more closely related. Non-Whites are slightly more prevalent in enlisted commissioning programs. This is highlighted by the Prior variable, which indicates that Non-Whites are much more likely to be prior enlisted than Whites. Approximately 24% of Black officers, 25% of Hispanic officers, and 17% of Asian officers have prior enlisted service, compared to only 12% of White officers. This difference may be due to socio-economic reasons rather than a racial/ethnicity bias. In some cases, Non-Whites may have fewer opportunities to attend college than Whites. As enlisted Marines, these individuals would have the opportunity to use the GI Bill or other enlisted commissioning programs to attend college.

Non-Whites also have slightly less probability of receiving their first MOS preference or one of their top three choices cumulatively. Approximately 45% of White officers will receive their first MOS preference on average. Based on the sample, only 37% of Black officers, 34% of Hispanic officers, and 42% of Asian officers will receive their first MOS preferences. Similarly, Non-White officers are more likely to receive an MOS outside of their top three MOS preferences. Approximately 37% of Black officers, 34% of Hispanic officers, and 42% of Asian officers will not receive one of their top three MOS preferences, compared to 33% of Whites.

Table 6.   Key Variables by Race/Ethnicity

Variable	White Mean	Std. Dev.	Black Mean	Std. Dev.	Hispanic Mean	Std. Dev.	Asian Mean	Std. Dev.	AIAN Mean	Std. Dev.	NHPI Mean	Std. Dev.	RaceDeclined Mean	Std. Dev.
Female	0.09	0.28	0.12	0.32	0.10	0.30	0.10	0.30	0.07	0.26	0.00	0.00	0.14	0.35
Male	0.91	0.28	0.88	0.32	0.90	0.30	0.90	0.30	0.93	0.26	1.00	0.00	0.86	0.35
White	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asian	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hispanic	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AIAN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
NHPI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
RaceDeclined	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
o2_married	0.41	0.49	0.51	0.50	0.53	0.50	0.37	0.49	0.62	0.49	0.60	0.55	0.36	0.48
o2_single	0.57	0.50	0.45	0.50	0.44	0.50	0.61	0.49	0.38	0.49	0.40	0.55	0.62	0.49
o2_divorced	0.02	0.14	0.04	0.20	0.03	0.17	0.02	0.14	0.00	0.00	0.00	0.00	0.02	0.14
o2_depndts	0.62	0.98	1.05	1.34	0.93	1.17	0.65	1.08	1.41	1.43	1.60	1.82	0.53	0.93
GCT	125.68	9.56	117.36	8.83	119.55	8.52	122.22	8.91	122.62	8.99	123.00	19.35	123.99	8.99
civmasters	0.09	0.29	0.18	0.38	0.11	0.31	0.10	0.30	0.03	0.19	0.20	0.45	0.10	0.30
Top	0.36	0.48	0.13	0.33	0.20	0.40	0.19	0.40	0.28	0.45	0.40	0.55	0.22	0.41
Middle	0.33	0.47	0.21	0.41	0.26	0.44	0.30	0.46	0.24	0.44	0.20	0.45	0.26	0.44
Lower	0.31	0.46	0.66	0.47	0.54	0.50	0.51	0.50	0.48	0.51	0.40	0.55	0.53	0.50
OCC	0.30	0.46	0.27	0.45	0.26	0.44	0.17	0.37	0.14	0.35	0.60	0.55	0.43	0.50
PLC	0.30	0.46	0.30	0.46	0.35	0.48	0.38	0.49	0.38	0.49	0.20	0.45	0.26	0.44
NROTC	0.26	0.44	0.24	0.43	0.24	0.43	0.31	0.46	0.28	0.45	0.20	0.45	0.20	0.40
USNA	0.14	0.35	0.18	0.38	0.15	0.35	0.15	0.36	0.21	0.41	0.00	0.00	0.11	0.31
Prior Enlisted	0.12	0.32	0.24	0.43	0.25	0.43	0.17	0.37	0.28	0.45	0.40	0.55	0.11	0.32
daysdepl	3.26	2.99	2.73	2.74	3.24	3.04	3.72	2.93	2.83	3.57	3.40	4.98	3.39	3.26

Variable	White Mean	Std. Dev.	Black Mean	Std. Dev.	Hispanic Mean	Std. Dev.	Asian Mean	Std. Dev.	AIAN Mean	Std. Dev.	NHPI Mean	Std. Dev.	RaceDeclined Mean	Std. Dev.
WIA	0.02	0.13	0.00	0.06	0.01	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.14
First MOS	0.45	0.50	0.37	0.48	0.38	0.49	0.32	0.47	0.48	0.51	0.40	0.55	0.36	0.48
Second MOS	0.14	0.34	0.15	0.36	0.16	0.37	0.19	0.39	0.14	0.35	0.20	0.45	0.16	0.37
Third MOS	0.09	0.28	0.11	0.31	0.12	0.33	0.07	0.26	0.14	0.35	0.20	0.45	0.11	0.32
Top3MOS	0.67	0.47	0.63	0.48	0.66	0.48	0.58	0.50	0.76	0.44	0.80	0.45	0.64	0.48
OtherMOS	0.33	0.47	0.37	0.48	0.34	0.48	0.42	0.50	0.24	0.44	0.20	0.45	0.36	0.48
5-Year Retained	0.79	0.40	0.84	0.36	0.82	0.38	0.86	0.35	0.72	0.45	0.80	0.45	0.82	0.39
USNARetained	0.19	0.39	0.20	0.40	0.16	0.37	0.18	0.38	0.03	0.19	0.20	0.45	0.16	0.37
	4627		544		449		108		29		5		160	

4.   Key Variables by Fiscal Year

Several key variables have mean distributions that vary over time when tabulated by fiscal year. Gender and Marital Status distributions are fairly consistent over time. Likewise, there is a relatively even distribution of officers for each TBS third over time, with slightly larger percentages in the lower third. Meanwhile, the average GCT scores have actually gone down on average over time since 1994. The average scores in 1994 were 126.44, while the average scores in 2002 were 123.17.

One key element of the fiscal year tabulation is the change in deployment time over the years. The deployed days mean increases for each new fiscal year; with over a one hundred day increase on average for fiscal years 2001 and 2002. This increase seems to follow the annual progression of the Global War on Terrorism. As new cohorts enter the Marine Corps, newly commissioned officers would enter deployable billets and have a direct opportunity to deploy. Earlier cohorts would be at different points in their career paths and may or may not have as much opportunity to deploy.

On average, the magnitude of the variable civmasters has gone down substantially over time. Approximately 17% of officers in 1994 had a Master's degree, but only 4% for 2001 and 3% for 2002. This negative trend could be directly related to the increased operational tempo due to the Global War on Terrorism. Officers in later fiscal year cohorts could have less time to pursue a Master's degree than officers from earlier cohorts.

Table 7.   Key Variables by Fiscal Year

Variable	1994 Mean	Std. Dev.	1995 Mean	Std. Dev.	1996 Mean	Std. Dev.	1997 Mean	Std. Dev.	1998 Mean	Std. Dev.	1999 Mean	Std. Dev.	2001 Mean	Std. Dev.	2002 Mean	Std. Dev.
F	0.07	0.26	0.08	0.27	0.10	0.30	0.08	0.27	0.10	0.30	0.08	0.28	0.10	0.30	0.14	0.34
M	0.93	0.26	0.92	0.27	0.90	0.30	0.92	0.27	0.90	0.30	0.92	0.28	0.90	0.30	0.86	0.34
White	0.82	0.38	0.81	0.39	0.76	0.43	0.78	0.41	0.74	0.44	0.77	0.42	0.78	0.41	0.80	0.40
Asian	0.01	0.10	0.02	0.13	0.01	0.11	0.02	0.12	0.02	0.15	0.02	0.15	0.02	0.15	0.02	0.14
Black	0.09	0.28	0.07	0.25	0.12	0.33	0.10	0.31	0.11	0.32	0.09	0.28	0.08	0.27	0.07	0.26
Hispanic	0.06	0.23	0.09	0.28	0.08	0.27	0.07	0.25	0.08	0.27	0.09	0.29	0.07	0.26	0.06	0.25
AIAN	0.00	0.07	0.00	0.04	0.00	0.04	0.01	0.08	0.00	0.07	0.01	0.10	0.01	0.07	0.00	0.04
NHPI	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
RaceDeclined	0.02	0.14	0.02	0.13	0.02	0.15	0.03	0.17	0.04	0.19	0.01	0.11	0.04	0.19	0.04	0.19
o2_married	0.42	0.49	0.44	0.50	0.45	0.50	0.42	0.49	0.44	0.50	0.45	0.50	0.42	0.49	0.40	0.49
o2_single	0.57	0.50	0.55	0.50	0.52	0.50	0.57	0.50	0.53	0.50	0.53	0.50	0.55	0.50	0.58	0.49
o2_divorced	0.01	0.12	0.01	0.12	0.03	0.16	0.02	0.13	0.03	0.18	0.02	0.14	0.02	0.15	0.03	0.16
o2_depndts	0.56	0.84	0.63	0.92	0.81	1.15	0.51	0.96	0.74	1.12	0.79	1.11	0.75	1.14	0.64	1.05
GCT	126.44	10.13	125.16	9.32	124.57	9.49	124.75	9.92	123.57	9.87	123.39	9.61	123.66	9.44	123.17	10.38
civmasters	0.17	0.37	0.13	0.33	0.13	0.34	0.13	0.34	0.09	0.28	0.09	0.29	0.04	0.20	0.03	0.17
Top	0.31	0.46	0.32	0.47	0.33	0.47	0.31	0.46	0.31	0.46	0.32	0.47	0.32	0.47	0.34	0.47
Middle	0.31	0.46	0.32	0.47	0.29	0.46	0.32	0.47	0.31	0.46	0.30	0.46	0.32	0.46	0.31	0.46
Lower	0.38	0.49	0.36	0.48	0.38	0.48	0.37	0.48	0.38	0.49	0.38	0.48	0.37	0.48	0.35	0.48
OCC	0.28	0.45	0.19	0.39	0.29	0.45	0.28	0.45	0.36	0.48	0.34	0.47	0.37	0.48	0.20	0.40
PLC	0.34	0.47	0.21	0.40	0.23	0.42	0.39	0.49	0.38	0.49	0.26	0.44	0.34	0.47	0.23	0.42
NROTC	0.30	0.46	0.49	0.50	0.26	0.44	0.21	0.41	0.11	0.32	0.28	0.45	0.19	0.39	0.28	0.45
USNA	0.07	0.26	0.12	0.33	0.22	0.41	0.12	0.33	0.15	0.36	0.13	0.34	0.10	0.30	0.29	0.45
Prior	0.03	0.17	0.04	0.20	0.05	0.22	0.12	0.33	0.22	0.42	0.23	0.42	0.21	0.41	0.18	0.39
daysdepl	2.32	3.17	2.51	3.14	2.77	2.99	3.18	3.21	3.13	2.91	3.20	2.82	4.43	2.46	4.37	2.26

WIA	0.00	0.04	0.01	0.08	0.01	0.12	0.02	0.14	0.01	0.09	0.01	0.08	0.02	0.14	0.06	0.24
First MOS	0.26	0.44	0.50	0.50	0.47	0.50	0.42	0.49	0.45	0.50	0.44	0.50	0.46	0.50	0.44	0.50
Second MOS	0.09	0.29	0.15	0.35	0.10	0.30	0.14	0.34	0.16	0.37	0.15	0.36	0.17	0.37	0.15	0.35
Third MOS	0.06	0.25	0.08	0.27	0.09	0.29	0.09	0.29	0.10	0.31	0.10	0.30	0.11	0.32	0.09	0.28
Top3MOS	0.41	0.49	0.73	0.45	0.67	0.47	0.65	0.48	0.72	0.45	0.69	0.46	0.74	0.44	0.67	0.47
OtherMOS	0.59	0.49	0.27	0.45	0.33	0.47	0.35	0.48	0.28	0.45	0.31	0.46	0.26	0.44	0.33	0.47
5-Year Retained	0.82	0.39	0.81	0.40	0.81	0.39	0.84	0.37	0.84	0.37	0.81	0.39	0.71	0.45	0.76	0.43
USNARetained	0.43	0.50	0.42	0.49	0.45	0.50	0.24	0.43	0.01	0.08	0.00	0.03	0.00	0.05	0.00	0.06
		680		735		620		861		832		912		774		508

5. Key Variables by Retention

Several key distinctions exist between officers who stayed in the Marine Corps beyond the 5- and 6-year retention points and officers who chose to leave. Although females are more prevalent in the 6-year sample, there is no difference in the percentages between those that leave and those that stay for either MSR model. The same is not true for race/ethnicity. White officers have a slightly lower retention rate for the 5-year model, but a higher retention rate for the 6-year model. When compared by marital status, the percentage of married Marines that stay for both MSR models is higher than the percentage of single Marines. This somewhat supports the notion that the Marine Corps recruits single Marines, but retains families.

The GCT scores between the officers who stay and leave the Marine Corps are effectively the same; however, there is a significant difference in the TBS third rankings. Officers ranked in the top third are much more likely to stay in the Marine Corps than officers in the middle or lower thirds. Approximately 33% of the officers who retain were ranked in the top third compared to just 31% for the middle and 36% for the lower thirds for the 5-year model. When compared to those officers that left the Marine Corps, the largest difference is between the top and lower thirds. The distribution of those that left the Marine Corps is weighted much more towards the lower third with approximately 45% of those that separated. Only 25% of those that separated were from the top third. For the 6-year model, approximately 39% of officers that stayed in the Marine Corps were from the top third, 34% from the middle, and 28% from the lower. The six-year model is weighted much more towards the top third for officers who stay in the Marine Corps. Even though the retention rate for the middle and lower thirds goes down, the lower third is more likely to leave the Marine Corps than the middle third. The percentage difference between those officers that separated from the Marines vice stayed for the middle third is just 1%, vice 9% for those officers ranked in the lower third for the 5-year model. Likewise, the difference is 4% for the middle and 6% for the lower third for the 6-year model.

There is also a significant difference between prior enlisted officers who stay and leave the Marine Corps. Approximately 12% of officers who stay are prior enlisted, vice only 8% of the officers who choose to leave for the 5-year model. This increase suggests that prior enlisted officers are slightly more likely to stay in the Marine Corps. The 6-year model is completely different. Approximately 41% of the officers who leave, while only 1% who stay are prior enlisted. This discrepancy could be due to the small 6-year sample size.

For the 5-year model only, there are significant differences in the retention rates across the sources of entry. Approximately 24% of the officers who leave and 37% of the officers who stay are OCC. The percentages for NROTC are approximately the same for both officers who stay and leave. However, the largest numbers of officers who leave are from PLC. Approximately 47% of the officers who leave and only 32% who stay are PLC.

One key element between officers who stay and leave the Marine Corps is the difference in deployment time. Officers who stay in the Marine Corps have approximately 350 days of deployment time on average compared to just 239 for the 5-year model and 304 for the 6-year model for officers who leave the Marine Corps. This trend seems to follow the literature review findings in Chapter III of this thesis that suggest that officers who deploy more have a higher retention rate than officers who do not deploy as much.

When the MOS preference variables are compared between the stay and leave groups for the 5-year model, there is a positive trend in retention for those that receive one of their top three MOS preferences. Likewise, there is a negative trend for those officers that do not receive one of their top three MOS preferences. Approximately 37% of the officers who leave and 34% of those that stay do not receive one of their top three MOS preferences. For the six-year model, the trend is the opposite. There is a negative trend for those officers who receive one of their top three MOS preferences and a positive trend for those officers who do not receive one of their top three MOS preferences. Approximately 28% of the officers who leave and 36% of the officers who stay do not receive one of their top three MOS preferences.

Table 8.   Key Variables by Retention

Variable	5-Year Separated Mean	Std. Dev.	5-Year Retained Mean	Std. Dev.	USNA Separated Mean	Std. Dev.	USNA Retained Mean	Std. Dev.
Female	0.09	0.28	0.08	0.28	0.14	0.34	0.14	0.35
Male	0.91	0.28	0.92	0.28	0.86	0.34	0.86	0.35
White	0.82	0.39	0.78	0.42	0.75	0.43	0.80	0.40
Asian	0.01	0.11	0.02	0.14	0.01	0.12	0.03	0.18
Black	0.07	0.25	0.09	0.29	0.13	0.33	0.08	0.26
Hispanic	0.07	0.25	0.08	0.27	0.08	0.27	0.08	0.26
AIAN	0.01	0.09	0.00	0.06	0.01	0.09	0.00	0.00
NHPI	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00
RaceDeclined	0.03	0.16	0.03	0.17	0.02	0.14	0.02	0.13
o2_married	0.33	0.47	0.42	0.49	0.60	0.49	0.68	0.47
o2_single	0.65	0.48	0.56	0.50	0.36	0.48	0.28	0.45
o2_divorced	0.02	0.13	0.02	0.14	0.04	0.19	0.05	0.21
o2_depndts	0.43	0.77	0.63	0.99	1.25	1.41	1.09	1.24
GCT	124.14	9.94	124.67	9.94	122.91	9.05	122.73	7.57
civmasters	0.01	0.11	0.12	0.32	0.10	0.30	0.29	0.45
Top	0.25	0.43	0.33	0.47	0.36	0.48	0.39	0.49
Middle	0.30	0.46	0.31	0.46	0.30	0.46	0.34	0.47
Lower	0.45	0.50	0.36	0.48	0.34	0.47	0.28	0.45
OCC	0.24	0.43	0.37	0.48				
PLC	0.47	0.50	0.32	0.47				
NROTC	0.29	0.45	0.31	0.46				
Prior Enlisted	0.08	0.27	0.12	0.32	0.41	0.49	0.01	0.08
daysdepl	2.39	3.16	3.44	2.92	3.04	2.94	3.57	2.67
WIA	0.00	0.03	0.02	0.13	0.02	0.14	0.01	0.11
First MOS	0.39	0.49	0.43	0.50	0.50	0.50	0.43	0.50
Second MOS	0.16	0.37	0.14	0.35	0.12	0.33	0.08	0.27
Third MOS	0.08	0.27	0.09	0.29	0.10	0.30	0.13	0.34
Top3MOS	0.63	0.48	0.66	0.47	0.72	0.45	0.64	0.48
OtherMOS	0.37	0.48	0.34	0.47	0.28	0.45	0.36	0.48
	1034		4039		676		173	

THIS PAGE INTENTIONALLY LEFT BLANK

V.   MODEL DEVELOPMENT AND REGRESSION ANALYSIS

To assess the effects of MOS placement on retention correctly, the author has chosen to use two main retention models: the first for a five-year minimum service requirement (MSR) and the second for a six-year MSR. Officers commissioned from NROTC, PLC, or OCC are only included in the five-year MSR model, while officers from USNA are only included in the six-year MSR model. Officers commissioned from ECP, MCP, or MECEP are excluded from both models, since these officers will have the longest years of service and be closer to career completion. Since these officers will have more completed service, they may be driven more by retirement than commissioned officers with no prior service time. The draw of retirement may bias downward the effects of MOS placement on retention.

A.   FIVE-YEAR MINIMUM SERVICE REQUIREMENT RETENTION MODELS: EXCLUDING PRIOR ENLISTED MARINES

1.   Five-Year MSR Retention Model #1, Excluding Priors

The first version of the Five-Year Retention Model is the simplest model and is designed to analyze the effects of job placement on retention based on a Marine's MOS placement compared to his or her MOS preferences, excluding prior enlisted Marines from the 5-year MSR sample. As stated above, prior enlisted Marines may have different motivations for retention that may bias the effects on the dependent variable for non-prior enlisted Marines.

The first model includes demographics and general service characteristics to factor out observable differences across the sample that may affect the retention dependent variable. The goal of the model is to isolate the effects of MOS placement on an officer's retention decision. Since the dependent variable is a binary term, a standard Probit model is used for each model to capitalize on maximum likelihood techniques and obtain more useful marginal effect coefficients. The first model is specified as the following.

$P(\text{Retained}=1|\,x) = \phi$ (βFemale + βBlack + βAsian + βHispanic + βAIAN + βNHPI + βRacedeclined + βSingle + βDivorced + βNumber of Dependents + βSecondMOS + βThirdMOS + βOtherMOS + βPLC + βOCC + βfy_01 + βfy_02 + βfy_03 + βfy_04 + βfy_05 + βfy_07 + βfy_08 + ε)

2. Five-Year MSR Retention Model #2, Excluding Priors: Ability

The second model adds an officer's GCT score and TBS third to the first model to determine the effect of these ability variables on retention and the sensitivity of the key MOS preference variables to other factors. The second model is specified below.

$P(\text{Retained}=1|\,x) = \phi$ (βFemale + βBlack + βAsian + βHispanic + βAIAN + βNHPI + βRacedeclined + βSingle + βDivorced + βNumber of Dependents + βSecondMOS + βThirdMOS + βOtherMOS + βPLC + βOCC + βfy_01 + βfy_02 + βfy_03 + βfy_04 + βfy_05 + βfy_07 + βfy_08 + βGCT + βTop + βLower + ε)

3. Five-Year MSR Retention Model #3, Excluding Priors: Ability + Masters + Service Information

Building off the first and second models, the third model includes a Marine's total number of deployed days, whether the Marine was wounded in action, and whether the Marine ever earned a Master's degree. These variables may affect an officer's decision to remain in the Marine Corps. The third model is specified below.

$P(\text{Retained}=1|\,x) = \phi$ (βFemale + βBlack + βAsian + βHispanic + βAIAN + βNHPI + βRacedeclined + βSingle + βDivorced + βNumber of Dependents + βSecondMOS + βThirdMOS + βOtherMOS + βPLC + βOCC + βfy_01 + βfy_02 + βfy_03 + βfy_04 + βfy_05 + βfy_07 + βfy_08 + βGCT + βTop + βLower + βCivmasters + βDaysdepl + βWIA + ε)

4. Five-Year MSR Model Hypothesized Effects

Table 9 provides the base group and expected hypothesized effects for selected independent variables for each of the Five-Year Retention Models. A plus sign represents an expected positive effect on an individual's retention decision to stay in the Marine Corps beyond the 5-year point. A minus sign represents an expected negative effect on an individual's retention decision to stay beyond the 5-year point in the Marine Corps. The first column of Table 9 indicates the control group for each variable in the model. The hypothesized effects for each variable are based on the control group, holding all other variables constant.

Table 9. Five-Year Retention Model Key Variable Hypothesized Effects

Dependent Variable Retained (1 , 0)		
Base Group	**Explanatory Variable**	**Hypothesized Effect**
Male		NA
	Female	-
White		NA
	Black	-
	Asian	-
	Hispanic	-
	AIAN	-
	NHPI	-
	RaceDeclined	-
Married		NA
	Single	-
	Divorced	-
NROTC		NA
	PLC	-
	OCC	-
First MOS Choice		NA
	Second MOS Choice	-
	Third MOS Choice	-
	Other MOS Choice	-
Middle Third		NA
	Top Third	+
	Lower Third	-
No Masters		NA
	Obtained a Masters	-

There are several important differences within the demographic variables that may cause a positive or negative effect on the dependent variable. Since the percentage of females that stay in the Marine Corps compared to the initial sample decreases in the summary statistics, the author predicts that the independent variable for females will show the same trend when compared to males in the regression models. The same is the case for the race/ethnicity variables. Since the officer corps is predominately white, the author predicts that other races/ethnicities will have lower retention rates when compared to whites and likewise also predicts that officers who are single or divorced will have lower retention rates compared to married Marines. Officers who are married may receive more utility from family services or healthcare. These benefits may encourage married officers to stay in the Marine Corps more than single or divorced Marines.

The NROTC source of entry program was chosen as the base group for the 5-year model because it provides the most comparable level of human capital investment to the USNA used in the 6-year model. Since NROTC provides a higher level of human capital investment than PLC or OCC, the author predicts that NROTC will have higher retention rates compared to other 5-year MSR programs.

Among the ability variables, the Master's degree and TBS third variables may have a significant impact on the dependent variable. Officers who earn a Master's degree may have more opportunities in the civilian job market than officers who do not have a Master's degree. Thus, a Master's degree may have a negative effect on retention compared to officers who do not earn a Master's degree. The comparison between TBS thirds is the opposite. Officers who perform well and achieve a higher rank at TBS, will be placed in a higher TBS third. Since TBS uses academic, military skills, and leadership screeners to determine performance, officers who rank in a higher TBS third have proven that they have more organizational ability. These officers should be a better fit for the organization, and thus, have higher retention rates. The author expects that the top TBS third will have a higher retention rate compared to the middle TBS third. Similarly, the lower third should have a lower retention rate compared to the middle third.

Lastly, MOS placement should have an impact on an officer's job satisfaction, since officers indicate to the Marine Corps during the job placement phase of training which MOS's the officer would prefer. Thus, an officer who receives his or her first MOS preference should have more job satisfaction than an officer who does not. In many cases, the utility between the first three MOS preferences may be fairly similar. The author predicts that there will be a slight negative effect on retention for officers who receive their second MOS preference. Likewise, there should also be a slightly larger negative effect on the retention of officers who receive their third MOS preference compared to those that receive their first MOS preference. For officers who do not receive one of their top three preferences, the author predicts that there will be a larger negative effect on retention than compared to officers who do receive one of their top three MOS preferences.

B. FIVE-YEAR MSR RETENTION MODELS: INCLUDING PRIOR ENLISTED MARINES

The second version of the Five-Year Retention Model includes prior enlisted Marines in the five-year retention sample to test the sensitivity of the dependent variable Retained and independent MOS preference variables. Each model from the Five-Year Retention Model without prior enlisted series was rerun to include prior enlisted Marines.

1. Five-Year MSR Retention Model #1, Including Priors

The first Five-Year Retention Model is the simplest model, which includes basic demographic, MOS preference, source of entry, and fiscal year information. The model also includes prior enlisted Marines and is specified below.

$P(\text{Retained}=1 \mid x) = \phi$ (βFemale + βBlack + βAsian + βHispanic + βAIAN + βNHPI + βRacedeclined + βSingle + βDivorced + βNumber of Dependents + βSecondMOS + βThirdMOS + βOtherMOS + βPLC + βOCC + βfy_01 + βfy_02 + βfy_03 + βfy_04 + βfy_05 + βfy_07 + βfy_08 + ε)

2. Five-Year MSR Retention Model #2, Including Priors: Ability

The second model includes a Marine's GCT score and TBS third. The second model also includes prior enlisted Marines in the Five-Year Retention Model sample and is specified below.

$P(\text{Retained}=1|\ x) = \varphi$ (βFemale + βBlack + βAsian + βHispanic + βAIAN + βNHPI + βRacedeclined + βSingle + βDivorced + βNumber of Dependents + βSecondMOS + βThirdMOS + βOtherMOS + βPLC + βOCC + βfy_01 + βfy_02 + βfy_03 + βfy_04 + βfy_05 + βfy_07 + βfy_08 + βGCT + βTop + βLower + ε)

3. Five-Year MSR Retention Model #3, Including Priors: Ability + Masters + Service Information

The third model includes a Marine's Master's degree information, total days deployed, and wounded in action status. The third model is specified below.

$P(\text{Retained}=1|\ x) = \varphi$ (βFemale + βBlack + βAsian + βHispanic + βAIAN + βNHPI + βRacedeclined + βSingle + βDivorced + βNumber of Dependents + βSecondMOS + βThirdMOS + βOtherMOS + βPLC + βOCC + βfy_01 + βfy_02 + βfy_03 + βfy_04 + βfy_05 + βfy_07 + βfy_08 + βGCT + βTop + βLower + βCivmasters + βDaysdepl + βWIA + ε)

C. SIX-YEAR MSR RETENTION MODELS: EXCLUDING PRIOR ENLISTED MARINES

The Six-Year Retention Models are specified exactly as the Five-Year Retention Models to provide an accurate base of comparison between PLC/OCC/NROTC and USNA Marine officers. The Six-Year Retention Models were also structured just as the

Five-Year Retention Models for testing the sensitivity of the dependent variable Retained and independent MOS preference variables when adding prior enlisted Marines to the Six-Year Retention Model sample.

1. Six-Year MSR Retention Model #1, Excluding Priors

The first Six-Year MSR Model is specified for USNA graduates only. This model is the simplest of the six-year models and includes a Marine's basic demographic information, MOS preference, source of entry, and fiscal year information, but does not include prior enlisted Marines. The first Six-Year Retention Model is specified below.

$P(\text{Retained}=1| x) = \phi$ (βFemale + βBlack + βAsian + βHispanic + βAIAN + βNHPI + βRacedeclined + βSingle + βDivorced + βNumber of Dependents + βSecondMOS + βThirdMOS + βOtherMOS + βPLC + βOCC + βfy_01 + βfy_02 + βfy_03 + βfy_04 + βfy_05 + βfy_07 + βfy_08 + ε)

2. Six-Year MSR Retention Model #2, Excluding Priors: Ability

The second Six-Year MSR Model is specified for USNA graduates only. This model adds an officer's GCT score and TBS third to the first model to determine the effect of these ability variables on retention and the sensitivity of the key MOS preference variables to other factors. The second model does not include prior enlisted Marines and is specified below.

$P(\text{Retained}=1| x) = \phi$ (βFemale + βBlack + βAsian + βHispanic + βAIAN + βNHPI + βRacedeclined + βSingle + βDivorced + βNumber of Dependents + βSecondMOS + βThirdMOS + βOtherMOS + βPLC + βOCC + βfy_01 + βfy_02 + βfy_03 + βfy_04 + βfy_05 + βfy_07 + βfy_08 + βGCT + βTop + βLower + ε)

3. Six-Year MSR Retention Model #3, Excluding Priors: Ability + Masters + Service Information

The third model is specified for USNA graduates only and includes a Marine's Master's degree information, total days deployed, and wounded in action status. The third model does not include prior enlisted Marines and is specified below.

$$P(\text{Retained}=1 | x) = \phi \ (\beta\text{Female} + \beta\text{Black} + \beta\text{Asian} + \beta\text{Hispanic} + \beta\text{AIAN} + \beta\text{NHPI} +$$

$\beta\text{Racedeclined} + \beta\text{Single} + \beta\text{Divorced} + \beta\text{Number of Dependents} + \beta\text{SecondMOS} +$

$\beta\text{ThirdMOS} + \beta\text{OtherMOS} + \beta\text{PLC} + \beta\text{OCC} + \beta\text{fy\_01} + \beta\text{fy\_02} + \beta\text{fy\_03} + \beta\text{fy\_04} +$

$\beta\text{fy\_05} + \beta\text{fy\_07} + \beta\text{fy\_08} + \beta\text{GCT} + \beta\text{Top} + \beta\text{Lower} + \beta\text{Civmasters} + \beta\text{Daysdepl} +$

$\beta\text{WIA} + \varepsilon)$

4. Six-Year MSR Model Hypothesized Effects

Table 10 provides the base group and hypothesized effects for selected independent variables for each of the Six-Year Retention Models. A plus sign represents an expected positive effect on an individual's retention decision to stay in the Marine Corps beyond the six-year point. A minus sign represents an expected negative effect on an individual's retention decision to stay beyond the six-year point in the Marine Corps. The first column of Table 10 indicates the control group for each variable in the model. The hypothesized effects for each variable are based on the control group, holding all other variables constant.

Table 10.   Six-Year Retention Model Key Variable Hypothesized Effects

Dependent Variable Retained (1 , 0)		
Base Group	**Explanatory Variable**	**Hypothesized Effect**
Male		NA
	Female	-
White		NA
	Black	-
	Asian	-
	Hispanic	-

66

Dependent Variable Retained (1 , 0)		
Base Group	**Explanatory Variable**	**Hypothesized Effect**
	AIAN	-
	NHPI	-
	RaceDeclined	-
Married		NA
	Single	-
	Divorced	-
First MOS Choice		NA
	Second MOS Choice	-
	Third MOS Choice	-
	Other MOS Choice	-
Middle Third		NA
	Top Third	+
	Lower Third	-
No Masters		NA
	Obtained a Masters	-

The hypothesized effects of the key independent variables for the Six-Year Retention Models are exactly similar to the hypothesized effects for the Five-Year Retention Model, except for the source of entry variables. Since the Six-Year Retention Model sample contains only Naval Academy graduates, the Six-Year Retention Model does not compare USNA graduates to other sources of entry.

D.   SIX-YEAR   MSR   RETENTION   MODELS: INCLUDING   PRIOR ENLISTED MARINES

1.   Six-Year MSR Retention Model #1, Including Priors

The first Six-Year MSR Model is specified for USNA graduates only and includes prior enlisted Marines. This model is the simplest model and includes a Marine's basic demographic information, MOS preference, source of entry, and fiscal year information. The first Six-Year Retention Model is specified below.

P(Retained=1| x) = ɸ (βFemale + βBlack + βAsian + βHispanic + βAIAN + βNHPI + βRacedeclined + βSingle + βDivorced + βNumber of Dependents + βSecondMOS + βThirdMOS + βOtherMOS + βPLC + βOCC + βfy_01 + βfy_02 + βfy_03 + βfy_04 + βfy_05 + βfy_07 + βfy_08 + ε)

2. Six-Year MSR Retention Model #2, Including Priors: Ability

The second Six-Year MSR Model includes prior enlisted Marines and is specified for USNA graduates only. This model adds an officer's GCT score and TBS third to the first model and is specified below.

P(Retained=1| x) = ɸ (βFemale + βBlack + βAsian + βHispanic + βAIAN + βNHPI + βRacedeclined + βSingle + βDivorced + βNumber of Dependents + βSecondMOS + βThirdMOS + βOtherMOS + βPLC + βOCC + βfy_01 + βfy_02 + βfy_03 + βfy_04 + βfy_05 + βfy_07 + βfy_08 + βGCT + βTop + βLower + ε)

3. Six-Year MSR Retention Model #3, Excluding Priors: Ability + Masters + Service Information

The third model is specified for USNA graduates only and includes a Marine's Master's degree information, total days deployed, and wounded in action status. The third model includes prior enlisted Marines and is specified below.

P(Retained=1| x) = ɸ (βFemale + βBlack + βAsian + βHispanic + βAIAN + βNHPI + βRacedeclined + βSingle + βDivorced + βNumber of Dependents + βSecondMOS + βThirdMOS + βOtherMOS + βPLC + βOCC + βfy_01 + βfy_02 + βfy_03 + βfy_04 + βfy_05 + βfy_07 + βfy_08 + βGCT + βTop + βLower + βCivmasters + βDaysdepl + βWIA + ε)

E.   CHAPTER SUMMARY

There are two major types of models outlined in this chapter for officers that will reach five-year and six-year retention decisions. For both the five-year and six-year models, the same series of models are used for each group to provide a way to compare the effects of MOS placement on retention for both groups and to test the sensitivity of the dependent variable Retained and MOS preference independent variables when new independent variables are introduced.

For each MSR group, prior enlisted Marines are excluded from the initial models since prior enlisted Marines may have different motivations for staying in the Marine Corps past the initial MSR. The prior enlisted Marines are then added to both MSR samples and the series of models are run again to determine if a difference exists in the effects of MOS placement on retention for each MSR group.

THIS PAGE INTENTIONALLY LEFT BLANK

VI. REGRESSION MODEL RESULTS

A. FIVE-YEAR RETENTION MODEL KEY VARIABLE RESULTS, WITHOUT PRIOR ENLISTED MARINES

The dependent variable for each of the Five-Year Retention Models that excludes prior enlisted Marines is 'Retained', which is constructed using a five-year MSR for PLC, OCC, and NROTC graduates. Table 11 provides the regression table results for the three Five-Year Retention Models that exclude prior enlisted Marines from the sample. Column 1 provides the independent variables for each of the models used. The remaining columns provide the Probit regression coefficients, with standard errors in parenthesis and partial effects in brackets, for each of the models outlined in Chapter V in order of progression.

Table 11.   Five-Year Retention Model Results without Prior Enlisted Marines

	(Model 1)	(Model 2)	(Model 3)
Independent Variables	**5-Year Retained**	**5-Year Retained**	**5-Year Retained**
Female	0.07158 (0.07783) [0.01959]	0.11271 (0.07868) [0.03028]	0.14339 (0.08105)* [0.03595]
TBS Race - Black	0.17327 (0.08438)** [0.04563]	0.22431 (0.08779)** [0.05771]	0.20490 (0.09161)** [0.05007]
TBS Race -Hispanic	0.06716 (0.08828) [0.01839]	0.10615 (0.08981) [0.02853]	0.12085 (0.09349) [0.03050]
TBS Race - Asian	0.41265 (0.17679)** [0.09614]	0.45320 (0.17738)** [0.10306]	0.43416 (0.17987)** [0.09332]
TBS Race - American Indian/Alaska Native	-0.27043 (0.30703) [-0.08405]	-0.22592 (0.30835) [-0.06895]	-0.21663 (0.30951) [-0.06286]
TBS Race - Native Hawaiian/Pacific Islander	-0.35806 (0.74791) [-0.11456]	-0.31744 (0.74164) [-0.10000]	-0.44396 (0.80897) [-0.13967]

	(Model 1)	(Model 2)	(Model 3)
Independent Variables	**5-Year Retained**	**5-Year Retained**	**5-Year Retained**
TBS Race - Declined	0.13699 (0.13489) [0.03634]	0.17448 (0.13593) [0.04538]	0.18850 (0.14075) [0.04592]
Single as a First Lieutenant	-0.06879 (0.07088) [-0.01916]	-0.05538 (0.07126) [-0.01540]	-0.07259 (0.07346) [-0.01907]
Divorced as a First Lieutenant	0.05276 (0.22503) [0.01449]	0.08252 (0.22642) [0.02229]	0.03667 (0.24016) [0.00956]
O-2 Number of Dependents	0.08745 (0.04599)* [0.02455]	0.08959 (0.04639)* [0.02506]	0.04905 (0.04748) [0.01300]
Received Second MOS Preference	-0.14761 (0.06497)** [-0.04323]	-0.13252 (0.06522)** [-0.03852]	-0.10924 (0.06735) [-0.02996]
Received Third MOS Preference	0.01654 (0.08246) [0.00461]	0.04326 (0.08298) [0.01192]	0.07619 (0.08551) [0.01961]
Did Not Receive One of Top 3 MOS Preferences	-0.13692 (0.05031)*** [-0.03907]	-0.11033 (0.05082)** [-0.03128]	-0.07960 (0.05260) [-0.02131]
Platoon Leader Course	-0.29347 (0.05249)*** [-0.08483]	-0.27968 (0.05270)*** [-0.08048]	-0.31765 (0.05457)*** [-0.08714]
Officer Candidate Course	0.16951 (0.05834)*** [0.04623]	0.16527 (0.06005)*** [0.04495]	0.16138 (0.06197)*** [0.04153]
6-yr point from commissioning: Fiscal Year 2001	-0.06555 (0.08675) [-0.01876]	-0.06873 (0.08703) [-0.01963]	-0.06997 (0.09057) [-0.01897]
6-yr point from commissioning: Fiscal Year 2002	-0.04398 (0.09412) [-0.01253]	-0.04667 (0.09451) [-0.01326]	-0.09166 (0.09857) [-0.02509]
6-yr point from commissioning: Fiscal Year 2003	0.03711 (0.08428) [0.01030]	0.03067 (0.08462) [0.00850]	-0.04236 (0.08865) [-0.01138]
6-yr point from commissioning: Fiscal	-0.03071 (0.08779)	-0.03401 (0.08833)	-0.06969 (0.09193)

Independent Variables	(Model 1) 5-Year Retained	(Model 2) 5-Year Retained	(Model 3) 5-Year Retained
Year 2004	[-0.00870]	[-0.00962]	[-0.01890]
6-yr point from commissioning: Fiscal Year 2005	-0.18935 (0.08311)** [-0.05609]	-0.19126 (0.08362)** [-0.05651]	-0.25617 (0.08739)*** [-0.07336]
6-yr point from commissioning: Fiscal Year 2007	-0.49999 (0.08291)*** [-0.16022]	-0.50685 (0.08359)*** [-0.16224]	-0.69272 (0.08930)*** [-0.22162]
6-yr point from commissioning: Fiscal Year 2008	-0.49896 (0.09519)*** [-0.16266]	-0.51791 (0.09591)*** [-0.16918]	-0.72941 (0.10195)*** [-0.24088]
GCT Scores, TBS		-0.00346 (0.00247) [-0.00097]	-0.00262 (0.00256) [-0.00069]
Top TBS Third		0.08364 (0.05822) [0.02305]	0.06832 (0.06037) [0.01786]
Lower TBS Third		-0.15828 (0.05325)*** [-0.04490]	-0.14556 (0.05501)*** [-0.03910]
Ever Obtained a Masters			1.06890 (0.13374)*** [0.17986]
Total Days Deployed			0.09481 (0.00813)*** [0.02512]
Constant	1.07259	1.51179	1.16163
	(0.09841)***	(0.32705)***	(0.33923)***
Observations	4508	4508	4443
Standard errors in parentheses Partial Effects in brackets			
* significant at 10%; ** significant at 5%; *** significant at 1%			

1. Gender

Based on the regression results in Table 11, the Female independent variable has a large positive value for each of the models used when compared to males. As more independent variables are introduced, the coefficient for the Female variable increases. However, the Female variable is insignificant for the first two models and is only significant at the 10% level for the final model. Since the Female variable is only weakly significant for the final model, the author concludes that gender is not a major factor in the retention decision for officers in the five-year MSR category.

2. Race/Ethnicity

For each of the Five-Year Retention Models that excludes prior enlisted Marines, several of the race/ethnicity variables appear to have no effect on a Marine's retention decision when compared to whites. For the Hispanic, American Indian and Alaska Native, Native Hawaiian and Pacific Islander, and RaceDeclined independent variables, there are no significant effects. For the Hispanic and RaceDeclined variables, the Probit coefficients are positive, but not significant. For the NHPI and AIAN variables, the Probit coefficients are negative, but not significant.

The results are significant, however, for Blacks and Asians compared to Whites. For both variables, there are positive and significant effects at the 5% level of significance for each model. The Black variable has a .04563 partial effect for the first model, .05771 partial effect for the second model, and a .05007 partial effect for the final model. For each model, the independent variable Black is significant at the 5% level. The Asian variable has a .09614 partial effect for the first model, a .10306 partial effect for the second model, and a .09332 partial effect for the final model. For each model, the Asian independent variable is significant at the 5% level. These results show that race has an important positive effect on the retention decisions for Marines who consider themselves to be Black or Asian.

3. MOS Placement

When compared to Marines who receive their first MOS preference, there are several key differences for Marines who may have received their second MOS preference, third MOS preference, or an MOS preference outside of their top three choices denoted as 'OtherMOS.' For Marines who receive their third MOS preference, MOS placement does not appear to be a significant factor in the Marine's retention decision, as the variable is not significant for any of the Five-Year Retention Models.

The independent variable for second MOS preference is negative and significant for the first two models at the 5% level. The partial effect for second MOS preference for the first model is -.04323, and -.03852 for the second model. The second MOS preference variable is not significant, however, for the final model, which includes days deployed and Master's degree information.

The OtherMOS preference variable has similar attributes as the second MOS preference variable, but is much more significant for the first model. Like the second MOS variable, the OtherMOS variable is negative and significant for the first two models. The important difference is that the OtherMOS variable is significant at the 1% level of significance for the first model and significant at the 5% level for the second model. When days deployed and Master's degree information are included in the final model, the OtherMOS is no longer significant.

Both the days deployed and Master's degree information variables are positive and significant at the 1% level of test significance. The Probit partial effect for days deployed is .02512 and the Master's degree partial effect is .17986. These variables may mitigate the effects of MOS placement based on their test significance.

B. FIVE-YEAR RETENTION MODEL KEY VARIABLE RESULTS, WITH PRIOR ENLISTED MARINES IN THE SAMPLE

Table 12 provides the regression table results for each of the Five-Year Retention Models, including a variable for prior enlisted service. The sample size increases from 4,508 to 5,073. The first column provides the independent variables for each of the

models used. The remaining columns provide the Probit regression coefficients, with standard errors in parenthesis and partial effects in brackets for each of the models outlined in Chapter V in order of progression.

Table 12.   Five-Year Retention Model Results with Prior Enlisted Marines

Independent Variables	(Model 1) 5-Year Retained	(Model 2) 5-Year Retained	(Model 3) 5-Year Retained
Female	0.03869 (0.07374) [0.01045]	0.08258 (0.07459) [0.02188]	0.11535 (0.07686) [0.02771]
TBS Race - Black	0.13648 (0.07720)* [0.03557]	0.20085 (0.08047)** [0.05087]	0.18085 (0.08396)** [0.04228]
TBS Race - Hispanic	0.07138 (0.07948) [0.01905]	0.11400 (0.08109) [0.02982]	0.12954 (0.08427) [0.03089]
TBS Race - Asian	0.41291 (0.16813)** [0.09347]	0.45150 (0.16861)*** [0.09982]	0.42771 (0.17059)** [0.08674]
TBS Race - American Indian/Alaska Native	-0.45096 (0.27013)* [-0.14558]	-0.41666 (0.27178) [-0.13281]	-0.37606 (0.27433) [-0.11101]
TBS Race - Native Hawaiian/Pacific Islander	-0.15854 (0.66301) [-0.04637]	-0.13101 (0.66301) [-0.03779]	-0.21707 (0.71513) [-0.06025]
TBS Race - Declined	0.07013 (0.12691) [0.01867]	0.11459 (0.12792) [0.02982]	0.09572 (0.13180) [0.02305]
Single as a First Lieutenant	-0.04820 (0.06365) [-0.01316]	-0.03882 (0.06387) [-0.01058]	-0.03975 (0.06589) [-0.00998]
Divorced as a First Lieutenant	0.01531 (0.15715) [0.00417]	0.02375 (0.15783) [0.00642]	0.01278 (0.16615) [0.00320]
O-2 Number of Dependents	0.11004 (0.03593)*** [0.03016]	0.10578 (0.03618)*** [0.02889]	0.08607 (0.03713)** [0.02167]
Received Second MOS	-0.14181	-0.12622	-0.10843

Independent Variables	(Model 1) 5-Year Retained	(Model 2) 5-Year Retained	(Model 3) 5-Year Retained
Preference	(0.06159)** [-0.04054]	(0.06182)** [-0.03581]	(0.06378)* [-0.02831]
Received Third MOS Preference	0.02670 (0.07754) [0.00725]	0.05469 (0.07805) [0.01465]	0.08265 (0.08044) [0.02013]
Did Not Receive One of Top 3 MOS Preferences	-0.13145 (0.04794)*** [-0.03666]	-0.10434 (0.04846)** [-0.02890]	-0.07907 (0.05017) [-0.02014]
Platoon Leader Course	-0.28765 (0.05097)*** [-0.08158]	-0.27521 (0.05119)*** [-0.07771]	-0.30848 (0.05293)*** [-0.08095]
Officer Candidate Course	0.15640 (0.05469)*** [0.04193]	0.13750 (0.05628)** [0.03684]	0.13907 (0.05812)** [0.03427]
6-yr point from commissioning: Fiscal Year 2001	-0.09721 (0.08414) [-0.02747]	-0.10009 (0.08437) [-0.02822]	-0.11258 (0.08776) [-0.02948]
6-yr point from commissioning: Fiscal Year 2002	-0.03187 (0.09177) [-0.00883]	-0.03174 (0.09211) [-0.00877]	-0.07848 (0.09604) [-0.02036]
6-yr point from commissioning: Fiscal Year 2003	0.07637 (0.08149) [0.02044]	0.07072 (0.08180) [0.01890]	-0.00466 (0.08577) [-0.00118]
6-yr point from commissioning: Fiscal Year 2004	0.04349 (0.08385) [0.01176]	0.04089 (0.08436) [0.01103]	-0.00410 (0.08797) [-0.00103]
6-yr point from commissioning: Fiscal Year 2005	-0.12651 (0.07933) [-0.03596]	-0.12827 (0.07980) [-0.03637]	-0.19475 (0.08350)** [-0.05215]
6-yr point from commissioning: Fiscal Year 2007	-0.44426 (0.07932)*** [-0.13765]	-0.44765 (0.07990)*** [-0.13844]	-0.62839 (0.08528)*** [-0.19041]
6-yr point from commissioning: Fiscal Year 2008	-0.44843 (0.09192)*** [-0.14188]	-0.46024 (0.09258)*** [-0.14570]	-0.65918 (0.09807)*** [-0.20711]
GCT Scores, TBS		-0.00165 (0.00233)	-0.00094 (0.00242)

	(Model 1)	(Model 2)	(Model 3)
Independent Variables	**5-Year Retained**	**5-Year Retained**	**5-Year Retained**
		[-0.00045]	[-0.00024]
Top TBS Third		0.07833 (0.05482) [0.02112]	0.06603 (0.05679) [0.01643]
Lower TBS Third		-0.15515 (0.05113)*** [-0.04306]	-0.13537 (0.05274)** [-0.03462]
Ever Obtained a Masters			1.13227 (0.13045)*** [0.17392]
Total Days Deployed			0.09198 (0.00771)*** [0.02316]
Wounded In Action			1.37177 (0.41287)*** [0.16328]
Constant	1.02351 (0.09103)***	1.24028 (0.30872)***	0.89228 (0.32069)***
Observations	5073	5073	5073
Standard errors in parentheses Partial Effects in brackets			
* significant at 10%; ** significant at 5%; *** significant at 1%			

1.   Gender

When prior enlisted Marines are added to the Five-Year Retention Model sample, the effects of gender remain the same. The independent variable Female is not a significant factor in the retention decision of Marines when compared to the male base group for any of the five-year models.

2.   Race/Ethnicity

There are several differences across the race/ethnic variables after including prior enlisted Marines to the Five-Year Retention Model. The variables for Hispanic, NHPI, and RaceDeclined are still not significant for any model. These variables do not effect a

Marine's decision to stay in the Marine Corps. The variable AIAN, however, is significant to the 10% level of test significance for the first model, but is insignificant for the following two models.

The variables for Black and Asian remain positive and significant for each of the models, with slight changes in significance between models and a slight reduction in the partial effect coefficients for each model. The Probit partial effect coefficient for Blacks for the first prior enlisted model is .03557 compared to .04563 for the model without prior enlisted included. Another key difference between the first model with and without prior enlisted Marines is the level of significance. For the first model with prior enlisted included, Black is significant at the 10% level vice the 5% level for the model without priors included. Likewise, the second model partial effect is .05087, compared to .05771 from the model without prior enlisted. The third model partial effect is .04228, compared to .05007 for the model without prior enlisted.

For the Asian variable, the Probit partial effect for the first model is .09347 compared to .09614 in the model without prior enlisted, .09982 for the second compared to .1036 in the model without priors, and .08674 for the final model compared to .09332 in the model without priors. For each model, the introduction of prior enlisted Marines reduces the partial effects of race and ethnicity on retention.

3. MOS Placement

Similar to the race variables, the inclusion of prior enlisted Marines in the Five-Year Retention Model changes the significance and partial effects of several of the MOS preference variables. The variable for third MOS preference does not change.

However, the second MOS preference variable becomes significant not only in the first and second models, but in the final model as well. However, the second MOS preference variable is only significant at the 10% level in the final model. The Probit partial effects are also lower when the prior enlisted are included. For the second MOS preference variable, the partial effects are -.04054 compared to -.04323 in the model without priors, -.03581 compared to -.03852 in the model without priors, and -.02831 compared to -.02996, which is insignificant, for the final model without priors.

Similarly, the addition of prior enlisted Marines has the same effect for 'OtherMOS'. For the first and second models, OtherMOS is significant at the 5% level of test significance. However, the partial effects of OtherMOS are reduced by the inclusion of prior enlisted Marines. The OtherMOS partial effects are -.03666 compared to -.03907 in the first model without priors and -.02890 compared to -.03128 in the second model without priors.

C. SIX-YEAR RETENTION MODEL KEY VARIABLE RESULTS, WITHOUT PRIOR ENLISTED MARINES

The dependent variable for each of the Six-Year Retention Models that exclude prior enlisted Marines is 'Retained', which is constructed using a six-year MSR for USNA graduates. Table 13 provides the regression table results for each of the Six-Year Retention Models that exclude prior enlisted. The first column provides the independent variables for each of the models used. The remaining columns provide the Probit regression coefficients, standard errors in parenthesis, and partial effects in brackets for each of the models outlined in Chapter V in order of progression.

Table 13. Six-Year Retention Model Results without Prior Enlisted Marines

Independent Variables	(Model 1) 6-Year Retained	(Model 2) 6-Year Retained	(Model 3) 6-Year Retained
Female	-0.22605 (0.19849) [-0.08291]	-0.09733 (0.21349) [-0.03628]	0.07096 (0.22425) [0.02673]
TBS Race - Black	0.10601 (0.29763) [0.04059]	0.19293 (0.30598) [0.07445]	0.31701 (0.32935) [0.12283]
TBS Race - Hispanic	-0.00775 (0.28400) [-0.00292]	-0.02813 (0.29107) [-0.01057]	-0.08760 (0.30328) [-0.03225]
TBS Race - Asian	0.06438 (0.43202) [0.02455]	0.05466 (0.44523) [0.02078]	0.09322 (0.47784) [0.03535]
TBS Race - Declined	0.31595 (0.67535) [0.12360]	0.27187 (0.66679) [0.10594]	0.05781 (0.81900) [0.02181]

Independent Variables	(Model 1) 6-Year Retained	(Model 2) 6-Year Retained	(Model 3) 6-Year Retained
Single as a First Lieutenant	-0.65303 (0.19027)*** [-0.23923]	-0.61857 (0.19437)*** [-0.22675]	-0.72697 (0.21404)*** [-0.26179]
Divorced as a First Lieutenant	0.15903 (0.41261) [0.06134]	0.11776 (0.41555) [0.04515]	-0.15753 (0.44100) [-0.05711]
O-2 Number of Dependents	0.08228 (0.08602) [0.03108]	0.05851 (0.08826) [0.02207]	0.06343 (0.09333) [0.02370]
Received Second MOS Preference	-0.20058 (0.26540) [-0.07342]	-0.14237 (0.26716) [-0.05254]	-0.05495 (0.28018) [-0.02036]
Received Third MOS Preference	0.32000 (0.24565) [0.12449]	0.45699 (0.25676)* [0.17857]	0.48720 (0.27665)* [0.18972]
Did Not Receive One of Top 3 MOS Preferences	-0.13759 (0.16494) [-0.05161]	-0.02436 (0.17011) [-0.00918]	0.12076 (0.18252) [0.04536]
6-yr point from commissioning: Fiscal Year 2001	-0.26753 (0.24964) [-0.09799]	-0.17627 (0.25441) [-0.06520]	0.03950 (0.27292) [0.01482]
6-yr point from commissioning: Fiscal Year 2002	-0.64324 (0.23662)*** [-0.22890]	-0.58647 (0.24086)** [-0.20968]	-0.37725 (0.25797) [-0.13650]
6-yr point from commissioning: Fiscal Year 2003	-0.83993 (0.25584)*** [-0.27510]	-0.85321 (0.26249)*** [-0.27784]	-0.70082 (0.27895)** [-0.23257]
6-yr point from commissioning: Fiscal Year 2004	-2.79062 (0.44693)*** [-0.54732]	-2.80761 (0.44869)*** [-0.54670]	-2.84780 (0.48707)*** [-0.53954]
GCT Scores, TBS		-0.02621 (0.00943)*** [-0.00988]	-0.02392 (0.00997)** [-0.00894]
Top TBS Third		0.28016 (0.18588) [0.10694]	0.22184 (0.19714) [0.08384]

Independent Variables	(Model 1) 6-Year Retained	(Model 2) 6-Year Retained	(Model 3) 6-Year Retained
Lower TBS Third		-0.37064 (0.19069)* [-0.13621]	-0.42955 (0.20427)** [-0.15536]
Ever Obtained a Masters			0.89477 (0.22639)*** [0.34479]
Total Days Deployed			0.12141 (0.02460)*** [0.04537]
Wounded In Action			0.72393 (0.94837) [0.28262]
Constant	0.81219	3.97308	3.02627
	(0.26971)***	(1.21111)***	(1.28423)**
Observations	395	395	395
Standard errors in parentheses Partial effects in brackets			
* significant at 10%; ** significant at 5%; *** significant at 1%			

1.   Gender

Based on the regression results for the Six-Year Retention Model that excludes prior enlisted Marines, the Female independent variable has a negative coefficient in the first two models and a positive value in the final model, when compared to the base group males, but is not significant for any model.

2.   Race/Ethnicity

When comparing other Non-White groups to Whites for USNA graduates, none of the race/ethnic variables are significant for any of the models.

3. MOS Placement

For the Six-Year Retention Model without prior enlisted Marines, the third MOS preference variable is the only variable of the three MOS preference variables with significant effects. The second MOS preference variable and the OtherMOS variable do not have significant effects on a Marine's decision to stay in the Marine Corps for any model. For the third MOS preference variable, there are no significant effects for the first retention model. For the second model, the partial effect is .17857, but is only significant at the 10% level of test significance. Likewise, the partial effect of the third MOS preference variable for the third model is .18972, but is only significant at the 10% level of test significance. Even though the third MOS preference variable appears to have a large significant effect on a Marine USNA graduates decision to stay in the Marine Corps, the effect is weakly significant at only the 10% level of test significance.

D. SIX-YEAR RETENTION MODEL KEY VARIABLE RESULTS, WITH PRIOR ENLISTED MARINES

Table 14 provides the regression table results for each of the Six-Year Retention Models that include prior enlisted Marines. The first column provides the independent variables for each of the models used. The sample size increases from 395 to 646 when prior enlisted are included. The remaining columns provide the Probit regression coefficients, with standard errors in parenthesis and partial effects in brackets for each of the models outlined in Chapter V in order of progression.

Table 14.   Six-Year Retention Model Results with Prior Enlisted Marines

	(Model 1)	(Model 2)	(Model 3)
Independent Variables	**6-Year Retained**	**6-Year Retained**	**6-Year Retained**
Female	-0.26059 (0.18966) [-0.04949]	-0.15546 (0.20136) [-0.02957]	-0.00623 (0.20998) [-0.00116]
TBS Race - Black	-0.32596 (0.23487) [-0.05889]	-0.28019 (0.24311) [-0.04963]	-0.24999 (0.25274) [-0.04116]
TBS Race - Hispanic	0.05268 (0.26243) [0.01136]	0.03811 (0.26769) [0.00786]	-0.02049 (0.27688) [-0.00378]

Independent Variables	(Model 1) 6-Year Retained	(Model 2) 6-Year Retained	(Model 3) 6-Year Retained
TBS Race - Asian	0.18997 (0.42620) [0.04414]	0.19273 (0.43699) [0.04330]	0.21184 (0.46655) [0.04463]
TBS Race - Declined	0.35580 (0.59722) [0.08938]	0.34161 (0.60781) [0.08254]	0.17755 (0.72623) [0.03667]
Single as a First Lieutenant	-0.68587 (0.17919)*** [-0.13189]	-0.64929 (0.18342)*** [-0.12054]	-0.77464 (0.19816)*** [-0.13036]
Divorced as a First Lieutenant	-0.12701 (0.35425) [-0.02496]	-0.18501 (0.35778) [-0.03381]	-0.38896 (0.38507) [-0.05760]
O-2 Number of Dependents	-0.08648 (0.06938) [-0.01819]	-0.10652 (0.07148) [-0.02156]	-0.12648 (0.07407)* [-0.02360]
Received Second MOS Preference	-0.23087 (0.24274) [-0.04376]	-0.16385 (0.24630) [-0.03076]	-0.07995 (0.25461) [-0.01435]
Received Third MOS Preference	0.31053 (0.22469) [0.07447]	0.43021 (0.23262)* [0.10460]	0.44194 (0.24264)* [0.10079]
Did Not Receive One of Top 3 MOS Preferences	-0.13886 (0.15102) [-0.02838]	-0.03066 (0.15564) [-0.00617]	0.13928 (0.16558) [0.02681]
6-yr point from commissioning: Fiscal Year 2001	-0.29586 (0.23838) [-0.05494]	-0.22612 (0.24221) [-0.04153]	-0.04702 (0.25580) [-0.00859]
6-yr point from commissioning: Fiscal Year 2002	-0.60390 (0.22484)*** [-0.10370]	-0.57100 (0.22832)** [-0.09500]	-0.38471 (0.24148) [-0.06249]
6-yr point from commissioning: Fiscal Year 2003	-1.13218 (0.23965)*** [-0.15181]	-1.14814 (0.24498)*** [-0.14614]	-1.03464 (0.25640)*** [-0.12474]
6-yr point from commissioning: Fiscal Year 2004	-2.95782 (0.41378)*** [-0.28158]	-2.99792 (0.41475)*** [-0.27297]	-3.03544 (0.44712)*** [-0.25314]

Independent Variables	(Model 1) 6-Year Retained	(Model 2) 6-Year Retained	(Model 3) 6-Year Retained
6-yr point from commissioning: Fiscal Year 2008	-3.01941 (0.42309)*** [-0.32808]	-3.11452 (0.43739)*** [-0.32395]	-3.13834 (0.46310)*** [-0.30185]
GCT Scores, TBS		-0.02274 (0.00870)*** [-0.00460]	-0.02034 (0.00899)** [-0.00380]
Top TBS Third		0.18819 (0.16814) [0.03941]	0.12481 (0.17656) [0.02385]
Lower TBS Third		-0.39019 (0.17521)** [-0.07328]	-0.43941 (0.18489)** [-0.07510]
Ever Obtained a Masters			0.72060 (0.19154)*** [0.17808]
Total Days Deployed			0.11283 (0.02299)*** [0.02105]
Wounded In Action			0.42590 (0.68518) [0.10009]
Constant	0.91300 (0.25637)***	3.69853 (1.12741)***	2.83285 (1.17248)**
Observations	646	646	646
Standard errors in parentheses Partial effects in brackets			
* significant at 10%; ** significant at 5%; *** significant at 1%			

1. Gender

Based on the regression results for the Six-Year Retention Model with the prior enlisted service variable, the Female independent variable has a negative coefficient for each of the models used when compared to the base group males, but is not significant for any model.

2. Race/Ethnicity

When comparing Non-Whites to Whites for USNA graduates, none of the race/ethnic variables is significant for any of the models.

3. MOS Placement

Similar to the Six-Year Retention Model without prior enlisted Marines included, the third MOS preference variable for the Six-Year Retention Model with prior enlisted Marine included is the only variable of the three MOS preference variables with significant effects. The second MOS preference variable and OtherMOS variable do not have significant effects on a Marine's decision to stay in the Marine Corps for any model. For the third MOS preference variable, there are no significant effects for the first retention model. For the second model, the partial effect is .10460 compared to .17857 in the model without priors. Likewise, the partial effect of the third MOS preference variable for the third model is .10079 compared to .18972 in the model without priors. For both models, the partial effects are only significant at the 10% level of test significance. The partial effect coefficients for the six-year model without prior enlisted Marines were dramatically reduced when prior enlisted Marines were included in the Six-Year Retention Model sample. However, even though the third MOS preference variable appears to have a large significant effect on a Marine USNA graduate's decision to stay in the Marine Corps, the effect is weak at the 10% level of test significance.

E. CHAPTER SUMMARY

In this chapter, the results of the five-year regression models with and without prior enlisted Marines are provided along with the results from the six-year regression models with and without prior enlisted Marines included. For the Five-Year Retention Model excluding prior enlisted Marines, gender and race have only positive effects when compared to the base group White males on a Marine's decision to stay in the Marine Corps. The Black and Asian race variables indicate a strong positive effect on a Marine's decision to remain in the Marine Corps.

Job placement is also a significant factor in the five-year models. For Marines who do not receive one of their top three MOS preferences, there are strong negative effects due to job placement on their retention decision. When prior enlisted Marines are included in the five-year models, there are similar results for race, gender, and MOS placement compared to the five-year model without priors; however, the overall coefficients for the partial effects are reduced. There are strong negative effects on a Marine's retention decision for those who do not receive one of their top three MOS preferences.

For the Six-Year Retention Models that excludes prior enlisted Marines, gender, race, and MOS preferences do not have a significant effect on a Marine's retention decision. Similar to the Five-Year Retention Model, the introduction of prior enlisted Marines to the Six-Year Retention Models has a dampening effect on the partial effect coefficients. There are, however, no significant effects on a Marine's retention decision for those officers who do not receive one of their top three MOS preferences for each of the six-year models.

THIS PAGE INTENTIONALLY LEFT BLANK

VII. CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

To determine the effects of MOS placement on retention, two separate Probit models were constructed based on an officer's Minimum Service Requirement (MSR) using data from the Center of Naval Analyses and the Marine Corps Total Force Data Warehouse. The first Probit model was designed to determine the effects of MOS placement on the retention of officers with a four-year MSR with one additional year to account for any variance in the time to separation due to operational commitments. The five-year model includes only officers commissioned from OCC, PLC, and NROTC. The second Probit model includes only officers who graduated from the United States Naval Academy and is constructed for a five-year MSR, with one additional year to account for variance in time to separation.

Three progressive Probit models were then constructed for both the five-year and six-year models. The three models for each of the MSR groups are exactly the same to provide an accurate base of comparison between the five and six-year MSR models. The first model includes demographics, sources of entry, MOS preferences, and retention fiscal year dummies. The second model includes three ability variables based on an officer's GCT score and TBS third. The final model includes wounded in action status, days deployed, and Master's degree information.

Initially, prior enlisted Marines were excluded from both the five- and six-year samples. After each MSR model was run without prior enlisted Marines in the sample, prior enlisted Marines were then added back to both the five and six-year samples. Both models were then re-run to test the sensitivity of the dependent variables and the MOS placement variables to the inclusion of prior enlisted personnel.

B.   CONCLUSIONS AND RECOMMENDATIONS

1.   MOS Placement

The effect of MOS placement on a Marine's retention decision is greatly affected if a Marine does not receive one of his or her top three MOS preferences. For the five-year model, the effect of receiving an MOS outside of a Marine's top three choices is negative and significant to the 1% level of test significance for the first model and to the 5% level for the second. However, when variables for days deployed and Master's degree information were added, the effects of MOS placement were mitigated. The introduction of prior enlisted Marines to the five-year sample produced basically the same results, but the partial effect coefficients were much smaller for each significant variable.

For the six-year model, MOS placement does not seem to have a significant effect on the retention decision of USNA graduates. Even though the summary statistics show that there is a positive trend in retention for those officers that do not receive one of their top three MOS preferences, the OtherMOS variable, representing Marines who did not receive one of their top three MOS choices, was insignificant in each of the three six-year models. When prior enlisted Marines were added to the six-year model sample, the partial effect of the OtherMOS variable was greatly reduced in the same way as in the five-year models, but it was still insignificant.

One argument for a lack of significant results in the six-year model may be due to the small sample size for USNA graduates. The data restrictions due to lack of MOS preference data, the truncation of fiscal year cohorts due to officers not reaching the MSR requirement, and the small number of USNA graduates that enter the Marines each year dramatically reduced the overall sample size for the six-year model. The effect of MOS placement outside of a Marine's top three MOS preferences may be an important factor in a Marine's retention decision for USNA graduates; however, the small sample size simply does not allow for an accurate estimate of that effect. One way to remedy this

shortfall would be to allow for more year cohorts in the sample. As more and more midshipmen graduate from the Naval Academy, there will be more officers to use in the six-year sample.

Another argument for the lack of significant results may be that the USNA is a distinctly different source of commissioning. Officers who attend USNA receive a much higher level of human capital investment compared to other commissioning sources. The Marine Corps requires a longer return on investment from this commissioning source in the form of a longer MSR. Since USNA graduates receive a much more intense training schedule, these officers may be more institutionally driven than occupationally driven.[65] If these officers are more institutionally driven, this difference may explain why these officers are impacted less by MOS placement than other sources of entry. For either argument, the author recommends that more officer cohorts be added to both the five- and six-year model to allow for more accurate estimates of the effects of MOS placement on the retention decisions of junior officers.

Another reason for adding more officer cohorts to the models is due to optimization process for the TBS job placement process. As outlined in Chapter II, approximately 75% of each TBS cohort will receive their top three MOS preferences. This percentage leaves approximately 25% of officers in each cohort that will not receive one of their top three MOS preferences. The optimization process may help to reduce the overall effect of MOS placement on an officer's job satisfaction, since approximately 83% of officers will receive an MOS within their top five choices and 93% will receive an MOS within their top 10 choices.[66] One limitation of this thesis is that MOS preferences are only maintained for a Marine's top three preferences. The author recommends that CNA maintain MOS preferences for at least the top 10 MOS preferences. This data will allow for more accurate estimates on the effects of MOS placement and reduce the overall burden for data management.

---

[65] Charles C. Moskos "Institutional/Occupational Trends in Armed Forces: An Update," *Armed Forces & Society* (Spring 1986): 378-379.

[66] The Basic School, http://www.tbs.usmc.mil/All_MOS_Assignment_Process.

2. Gender

When compared to males in the five-year models without prior enlisted Marines, the Female variable did not have any significant effect on retention for the first two models. In the final model, the Female variable had a positive, but weak effect on a Marine's retention decision. When prior enlisted Marines were included in the five-year sample, the Female variable continued to be positive, but was not a significant factor in a Marine's retention decision. When compared to males in the six-year models with and without prior enlisted Marines, the Female variable was not a significant factor in a Marine's retention decision. Even though the summary statistics show that females have a slightly lower retention rate compared to males, it appears that gender does not have a significant effect on a Marine's retention decision.

3. Race/Ethnicity

For the five-year models with and without prior enlistees in the sample, being Black or Asian has a strong positive effect on an officer's retention decision. This result is further emphasized by the summary statistics that show that these two races have higher retention rates compared to Whites. The inclusion of prior enlistees may reduce the overall magnitude of the coefficients of the race/ethnic variables, but the significance of the variables remains the same. For the six-year models with and without prior enlistees, however, there are no effects due to race.

C. FOLLOW-ON RESEARCH QUESTIONS

During the course of this thesis, the author discovered several areas of interest that were beyond the scope of this research, but may have a relevant place in future research. The following sections provide an insight to those issues and the possibilities for future opportunities.

1. The Effects of MOS Placement on Alternative Career Paths

When the civmasters variable was added to the final five-year model with and without prior enlisted Marines, the effects of MOS placement were completely mitigated.

However, the civmasters variable had a very large positive effect that was significant at the 1% level for both retention models. The partial effect of civmasters for the five-year model without prior enlisted Marines was .17986 versus .17392 for the model with prior enlisted Marines. The partial effect coefficient for the six-year model without prior enlisted Marines was .34479 versus .17808 for the model with prior enlisted Marines.

One significant limitation for the civmasters variable was that the author could not distinguish degrees earned from the Naval Postgraduate School under the Special Education Program or International Affairs Officer Program from Master's degree earned from civilian institutions out of the 607 Marines who earned a Master's degree in the sample. For both programs, a Marine must self-select the program and the Marine will automatically incur a new minimum service obligation. For these cases, a Marine will automatically remain in the Marine Corps beyond the initial MSR.

Marines who may not be satisfied or have a poor job fit may still wish to remain in the Marine Corps, but under an alternative career path. Programs such as SEP and IAOP may provide Marines with an outlet to relieve job dissatisfaction while remaining in the institution. This proposed effect might explain the extreme positive effect of civmasters on the retention decision of Marines. The author recommends that future research examine this trend to determine the true effects of civilian education on the retention of junior officers.

2.   A Cost Benefit Analysis Based on MOS Preferences

Based on the findings, MOS placement does have a significant negative impact on an officer's retention decision. However, what this thesis cannot provide is the economic impact poor MOS placement has on the Marine Corps. The Marine Corps invests a large amount of capital to recruit and train its officer cohorts. Approximately 25% of each officer cohort will receive an MOS outside of his or her top three MOS preferences. Even though the Marine Corps is highly successful at placing officers in one of their top preferences, there still exists a large number of Marines who may be dissatisfied with their MOS placements.

93

Aside from the cost of recruitment and training, one potential cost could be the loss of Marines from the top third of each TBS class due to MOS placement. These officers have higher retention rates and performance evaluations, on average, than officers from the middle or lower thirds. These officers have also demonstrated that they have higher academic, physical, and military skills abilities during their course of training at TBS. Since the TBS Company staff's evaluations also contribute to each officer's placement, officers from the top third have also demonstrated stronger leadership ability. Thus, the loss of officers from the top third may be may be greater to the Marine Corps than the loss of officers from the middle or lower thirds. A cost benefit analysis would provide a better understanding of the actual costs associated with poor job placement during the job placement process.

3.   Process Analysis

The Marine Corps operates under a closed loop personnel system, which requires a large number of applicants at the initial point of entry to ensure that enough personnel survive through the career process, due to various forms of attrition, and to meet internal labor market requirements for mid to upper personnel system echelons. Likewise, the Marine Corps invests a great deal of capital to recruit and train these entry-level officers, with the assumption that the Marine Corps will not retain every officer.
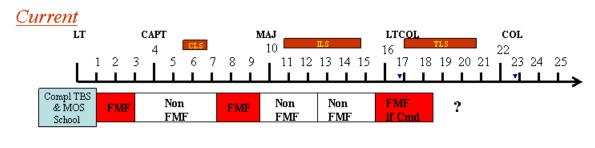
Additionally, the pool of officers available for internal Marine Corps labor markets is relatively small. Although the officers that constitute this pool are highly qualified, the assumption is that the Marine Corps will want the highest quality Marines from this group to fill its billets. Attrition reduces the total number of highly qualified Marines available in this pool. In this sense, the Marine Corps is still competing with the civilian labor market for personnel. One way to increase the quality of the labor market is to target high-quality officers with incentives, such as bonuses. However, there may be other ways to improve the labor pool, by targeting high quality officers with other incentives, such the Special Education Program and International Affairs Officer Program.

Since the Marine Corps uses such a small number of officers to meet future personnel requirements, there may be opportunities within the current personnel process to maximize the quality of officers within the retention pool and carve out a better market share of its officer cohorts for retention. Based on the summary statistics, a large percentage of officers within each TBS third will not receive their top MOS preferences. A process analysis could provide insights and recommendations on how to improve the personnel process, by moving program applications or adding other incentives, to maximize the highest quality officers in the available labor pool. Changing the process could offer the Marine Corps a distinct competitive advantage by providing a higher quality labor pool, potential recruiting and training cost savings, and non-bonus incentives for personnel retention.
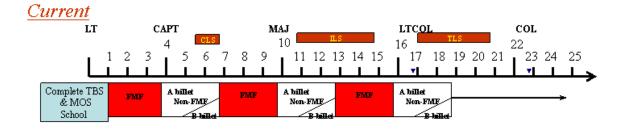
THIS PAGE INTENTIONALLY LEFT BLANK

Combat Arms Career Progression
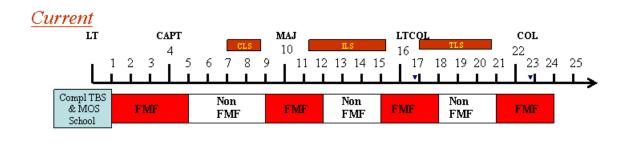
Current

LT	CAPT		MAJ		LTCOL		COL

CLS   ILS   TLS

4   10   16   22

1 2 3   5 6 7 8 9   11 12 13 14 15   17 18 19 20 21   23 24 25

Compl TBS & MOS School	FMF	Non FMF	FMF	Non FMF	Non FMF	FMF if Cmd	?

CS/CSS Career Progression

Current

LT	CAPT		MAJ		LTCOL		COL

CLS   ILS   TLS

4   10   16   22

1 2 3   5 6 7 8 9   11 12 13 14 15   17 18 19 20 21   23 24 25

Complete TBS & MOS School	FMF	A billet Non-FMF / B billet	FMF	A billet Non-FMF / B billet	FMF	A billet Non-FMF / B billet

---
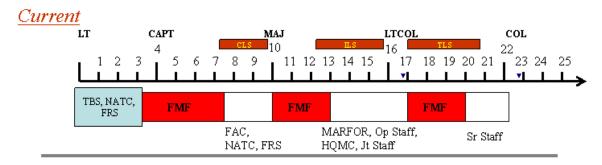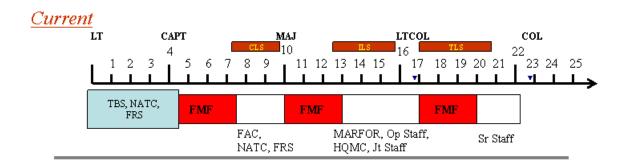
Air-Ground Career Progression

LT			CAPT				CLS		MAJ		ILS				LTCOL		TLS				COL			

LT   CAPT   MAJ   LTCOL   COL
 4   10   16   22

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

Compl TBS & MOS School	FMF	Non FMF	FMF	Non FMF	FMF	Non FMF	FMF

Rotary Wing Career Progression

LT   CAPT   MAJ   LTCOL   COL
 4   10   16   22

CLS   ILS   TLS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

TBS, NATC, FRS	FMF		FMF		FMF	

FAC, NATC, FRS   MARFOR, Op Staff, HQMC, Jt Staff   Sr Staff

Fixed Wing Career Progression

LT   CAPT   MAJ   LTCOL   COL
 4   10   16   22

CLS   ILS   TLS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

TBS, NATC, FRS	FMF		FMF		FMF	

FAC, NATC, FRS   MARFOR, Op Staff, HQMC, Jt Staff   Sr Staff

LIST OF REFERENCES

Areas of Specialty. United States Marine Corps Marines.com, 2008,
     http://officer2.marines.com/page/Areas-Of-Specialty.jsp (accessed December 18,
     2008).

The Basic School. United States Marine Corps Marines.com. 2008,
     http://officer2.marines.com/page/The-Basic-School-O.jsp (accessed December
     18, 2008).

Bowling, Kirby, Dan Stimpson with Cathy Hiatt. *The Effect of Naval Postgraduate
     School (NPS) on the Promotion of Marine Corps Officers*. Alexandria, VA:
     Center of Naval Analyses, April 2008.

Bowman, William R. and Stephen L. Mehay. "Graduate Education and Employee
     Performance: Evidence from Military Personnel." *Economics of Education
     Review* 18 (1998): 453-463.

Career Progression. The Basic School, United States Marine Corps, 2008,
     http://www.tbs.usmc.mil/All_Career_Progression.asp (accessed December 9,
     2008).

Doganca, Erkan. *Officer Career Paths and the Effects of Commissioning Sources on the
     Survival Patterns of Army Officers*. Master's Thesis, Naval Postgraduate School,
     September 2006.

Fricker, Ronald. *The Effects of Perstempo on Officer Retention in the U.S. Military*. Santa
     Monica, CA: RAND, 2002.

Hansen, Michael L. and Michael J. Moskowitz. *The Effect of Compensation on Aviator
     Retention*. Alexandria, VA: Center of Naval Analyses, November 2006.

Koopman, Martha E. *Creating Innovative Career Paths*. Alexandria, VA: Center of
     Naval Analyses, January 2006.

Korkmaz, Ibrahim. *Analysis of the Survival Patterns of United States Naval Officers*.
     Master's Thesis, Naval Postgraduate School, March 2005.

Marine Corps Order 1040.43A. Subject: Enlisted-to-Officer Commissioning Program,
     May 2000.

Marine Corps Order 1230.5A. Subject: Classification Testing, July 1993.

Marine Corps Order 1560.15L. Subject: Marine Corps Enlisted Commissioning
     Education Program, August 1994.

McHugh, Cathleen M., Holly A. Potter, Maj. Dan Stimpson, USMC, Michael J.
       Moskowitz, and Aline O. Questor with Dana L Samuelson and Ian D. MacLeod.
       Analyses of the Marine Corps Officer Manpower System: Final Report.
       Alexandria, VA: Center of Naval Analyses May 2006.

MOS Assignment Process. The Basic School, United States Marine Corps, 2008,
       http://www.tbs.usmc.mil/All_MOS_Assignment_Process.asp (accessed December
       9, 2008).

MOS FAQ. United State Marine Corps, The Basic School, 2008,
       http://www.tbs.usmc.mil/All_MOS_FAQ (accessed December 9, 2008).

Moskos, Charles C. "Institutional/Occupational Trends in Armed Forces: An Update."
       Armed Forces & Society (Spring 1986): 377-382.

Naval Reserve Officer Training Course Requirements. United States Marine Corps.
       Marines. USMC.mil. 2008,
       https://www.marines.usmc.mil/G3/Officer/nrotcrequirement.htm (accessed
       December 4, 2008).

Officer Candidate Course. United States Marine Corps, Marines.com. 2008,
       http://officer2.marines.com/page/Officer-Candidate-Course.jsp (accessed
       December 15, 2008).

Platoon Leaders Class. United States Marine Corps Marines.com. 2008,
       http://officer2.marines.com/page/Platoon-Leaders-Class.jsp (accessed December
       15, 2008).

Quester, Aline O. and Catherine M. Hiatt. *Final Report: Street-to-Fleet Study. Volume II:
       Street-to-Fleet for Commissioned Officers*. Alexandria, VA: Center of Naval
       Analyses, February 2005.

Quester, Aline O., Anita U. Hattiangadi, and Robert W. Shuford. *Marine Corps Retention
       in the Post-9/11 Era: The Effects of Deployment Tempo on Marines with and
       without Dependents*. Alexandria, VA: Center of Naval Analyses, January 2006.

Quester, Aline O., Anita U. Hattiangadi, Lewis G. Lee, and Robert W. Shuford. *Marine
       Corps Deployment Tempo and Retention in FY05*. Alexandria, VA: Center of
       Naval Analyses, March 2006.

"United States Naval Academy Catalog 2007-2008 Admissions." *USNA.edu*. United
       States Naval Academy Admissions. http://www.usna.edu/Catalog/ (accessed
       November 20, 2009).

"United States Naval Academy Catalog 2007-2008 Career Opportunities after
       Graduation." *USNA.edu.* United States Naval Academy Admissions.
       http://www.usna.edu/Catalog/ (accessed November 20, 2008).

"United States Naval Academy Catalog 2007-2008 Introduction." *USNA.edu*. United States Naval Academy Admissions. http://www.usna.edu/Catalog/ (accessed November 20, 2008).

"United States Naval Academy Class of 2012 Profile." *USNA.edu*. United States Naval Academy Admissions. http://www.usna.edu/Admissions/documents/2008_PlebeProfile_ClassOf2012_0725.pdf (accessed November 20, 2008).

United States Marine Corps. Marine Administrative Message (MARADMIN). FY09 *Naval Reserve Officer Corps Training Program.* Washington, D.C.: http://www.marines.mil/news/messages/Pages/MARADMIN508-08 (accessed November 28, 2008).

United States Naval Academy Admissions. United States Naval Academy, 2008, http://www.usna.edu/Admissions/ (accessed November 20, 2008).

Wiler, Darby and Nicholas Hurndon. *An Analysis of Performance at The Basic School as a Predictor of Officer Performance in the Operating Forces*. Master's Thesis, Naval Postgraduate School, March 2008.

THIS PAGE INTENTIONALLY LEFT BLANK

INITIAL DISTRIBUTION LIST

1.   Defense Technical Information Center
        Ft. Belvoir, Virginia

2.   Dudley Knox Library
        Naval Postgraduate School
        Monterey, California

3.   Marine Corps Representative
        Naval Postgraduate School
        Monterey, California

4.   Dr. Stephen Mehay
        Government School of Business and Public Policy
        Monterey, California

5.   Dr. Elda Pema
        Government School of Business and Public Policy
        Monterey, California

6.   Mr. Wayne Wagner
        Strategic Affairs Office (N1Z)
        Arlington Annex
        Washington, DC

7.   Director, Training and Education, MCCDC, Code C46
        Quantico, Virginia

8.   Director, Marine Corps Research Center, MCCDC, Code C40RC
        Quantico, Virginia

9.   Marine Corps Tactical Systems Support Activity (Attn: Operations Officer)
        Camp Pendleton, California

10.   Commanding Officer
        The Basic School
        Quantico, Virginia